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A Plague on Both Our Houses: Canada, the United States, and Biological Terrorism

by

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ABSTRACT

The United States and Canada have developed remarkably different responses to the bioterrorist threat. This study attempts to ascertain which response strategy is best suited to combating that threat. The first chapter compares the threat of biological terrorism to the United States and Canada. It determines that the threat of biological terrorism is much greater to the United States, and that the most likely acts to occur in either country are hoaxes. Macroterrorist attacks are the least likely. The second chapter examines both states' responses to the threat. It reveals that the American approach is poorly organized with many redundant programs, while the Canadian strategy fails to adequately respond to the threat of macroterrorism. The third chapter offers suggestions for improvement to both states' response strategies, and attempts to determine which state's response is most appropriate. However, it is concluded that neither response strategy is inherently better than the other.

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LIST OF ABBREVIATIONS

Abbreviation	
AIDS	Acquired Immune Deficiency Syndrome
ALF	Animal Liberation Front
ATCC	American Type Culture Collection
ATF	Bureau of Alcohol, Tobacco, and Firearms (US)
BIDS	Biological Integrated Detection System (US)
BoTox	Botulinum Toxin
BTWC	Biological and Toxin Weapons Convention
CB	Chemical Biological
CBIRF	Chemical and Biological Incident Response Force (US)
CBM	Confidence Building Measure
C/B-RRT	Chemical Biological Rapid Response Team (US)
CDC	Centers for Disease Control and Prevention (US)
CF	Canadian Armed Forces
CFB	Canadian Forces Base
CIBADS	Canadian Integrated BioChemical Agent Detection System
CSE	Communications Security Establishment (Canada)
CSIS	Canadian Security Intelligence Service
DARPA	Defense Advanced Research Projects Agency (US)
DMAT	Disaster Medical Assistance Team (US)
DND	Department of National Defence (Canada)
DOD	Department of Defense (US)
DOE	Department of Energy (US)
DOJ	Department of Justice (US)
DPP	Domestic Preparedness Plan (US)
DRES	Defence Research Establishment Suffield (Canada)
EMETIC	Evan Mecham Eco-Terrorist International Conspiracy
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EPA	Environmental Protection Agency (US)
ER	Emergency Room
EU	European Union
FBI	Federal Bureau of Investigation (US)
FEMA	Federal Emergency Management Agency (US)
GAO	General Accounting Office (US)
GIA	Algerian Armed Islamic Group
HAZMAT	Hazardous Materials
HHS	Department of Health and Human Services (US)
HMRU	Hazardous Materials Response Unit (US)
IAEA	International Atomic Energy Agency
IBAD	Interim Biological Agent Detector (US)
JEPP	Joint Emergency Preparedness Program (Canada)
JTF	Joint Task Force (US)

LFTSC	Land Forces Technical Staff Course (Canada)
LTTE	Liberation Tigers of the Tamil Eelam
MEK	Mujahedin e-Khalq
MMRS	Metropolitan Medical Response System (US)
NAS	National Academy of Science (US)
NBCRT	Nuclear Biological Chemical Response Team (Canada)
NCTP	National Counter-Terrorism Plan (Canada)
NDPO	National Domestic Preparedness Office (US)
NIH	National Institute of Health (US)
NMRT	National Medical Response Team (US)
NPS	National Pharmaceutical Stockpile (US)
NSC	National Security Council (US)
OEP	Office of Emergency Preparedness (US)
OMB	Office of Management and Budget (US)
ONDCP	Office of National Drug Control Policy (US)
PDD	Presidential Decision Directive (US)
Prime BEEF	Prime Base Engineering Emergency Forces (US)
RAID	Rapid Assessment and Initial Detection (US)
RCMP	Royal Canadian Mounted Police
R&D	Research and Development
TEU	Technical Escort Unit (US)
TOPOFF	Top Official Exercise (US)
UN	United Nations
UNSCOM	United Nations Special Commission in Iraq
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USSS	United States Secret Service
VA	Department of Veterans Affairs (US)
VEE	Venezuelan Equine Encephalitis
VEREX	<i>Ad Hoc</i> Group of Government Experts to Identify and Examine Verification Measures from a Scientific and Technical Standpoint
WMD	Weapons of Mass Destruction
WTO	World Trade Organization

Introduction

There is a startling difference between Canada's and the United States' responses to the threat of biological terrorism. While the government of the United States has responded to this potentially apocalyptic threat with a combination of new counter-terrorism laws, specially trained National Guard teams, well-funded first respondent training programs, and pressure on international organizations to reduce illicit trade in biological materials,¹ Canada has responded with markedly less fervour. The Canadian government has introduced no new counter-terrorism laws, and the bodies responsible for defending Canada against bioterrorism have received nowhere near the same increases in funding as their American counterparts. Indeed, Canada's intelligence organizations have only begun to take the threat of biological terrorism seriously this past year.²

The discrepancies between these two countries' responses to the bioterrorist threat leave us to wonder which approach is more appropriate to the threat currently posed by biological terrorism. Is the threat of biological terrorism so great that it requires the implementation of Presidential Decision Directives, the expenditure of billions of dollars, and the formulation of new counter-terrorism laws? Or, is the threat posed by bioterrorism so small that it may be effectively minimized with the modest programs so far implemented in Canada? Which set of responses is best suited to dealing with the type of threat posed by biological terrorism? This study will attempt to answer that question.

It may be the case that the discrepancies in responses may be explained by simply acknowledging that biological terrorism does not threaten both states equally, and that each country's responses are uniquely and ideally suited to combating the type and intensity of threat experienced in that country. The first chapter of this paper will ascertain whether it is indeed true that bioterrorism threatens the United States and Canada unequally. It will examine which types of bioterrorist attack are most likely to occur in Canada and the

United States (for the threat of bioterrorism is far from homogenous, as will be shown), and determine the relative intensity of the threat to both states.

To determine the intensity of the threat to the United States, it may be possible to rely on any number of scholarly assessments published within the last year. However, the vast majority of these assessments typically rely too heavily on statements about the infinite vulnerability of open societies to terrorism, and such truisms as "(A)dvances in technology have made terrorism with weapons of mass destruction easier to carry out."³ These assessments may also contain a heavily revised history of the Aum Shinrikyo's attempts to deploy chemical and biological weapons that supports whatever conclusions the authors would like to draw.⁴ Other scholarly assessments rely entirely on the scant history of bioterrorism, implying that just because no major bioterrorist event has ever occurred in the United States, none ever will.⁵ The most these scholars are usually able to conclude is that the threat of biological terrorism is increasing, or that it is no longer a question of "if" but "when."⁶ However, they are unable to indicate whether the threat is increasing from "low" to "high," or simply from "extremely low" to "very low." Nor do they predict if this imminent biological event will occur sometime after Marx's inevitable socialist revolution or before the Second Coming of Christ. For their part, American intelligence agencies have not yet published an unclassified assessment of the threat,⁷ while Canadian scholars have virtually ignored the topic of biological terrorism.

Since we do not have an adequate assessment of the threat of bioterrorism to either country, we must produce our own. The threat of bioterrorism to Canada and the United States may be measured by determining which types of bioterrorist acts certain terrorist groups are most likely to gravitate towards, based on their differing capacities to overcome the technical and motivational obstacles associated with each type of act, and then comparing these results to the types of terrorist groups that currently pose a threat to Canada and the United States. The assessment may be supplemented by ascertaining

whether Canada or the United States possess any qualities that might increase the likelihood of or their vulnerability to a bioterrorist attack. Data to be used in the assessment of the threat to the United States may be obtained from a number of government and academic sources, while information for our assessment of the threat to Canada will largely be obtained through examination of documents published by the Canadian Security Intelligence Service (CSIS) and interviews with counter-terrorism authorities at CSIS itself.⁸

The first chapter will begin with a discussion of the many types of biological terrorism. Few authors acknowledge that there are potentially dozens of different acts using biological weapons that terrorists may choose to accomplish their assorted ends, and instead focus on the massively destructive "macroterrorist" sort of incident. Our assertion that there is more than one facet to the bioterrorist threat is largely a function of our rather broad definition of biological terrorism, and our eschewal of the term "Weapons of Mass Destruction" (WMD). For the purposes of this paper, biological weapons will be defined as weapons that "disseminate pathogenic microorganisms or biologically-produced toxins to cause illness or death in human, animal, or plant populations,"⁹ while terrorism will be defined as the use or threatened use of violence by non-state actors against civilian targets to accomplish an ideological, political, or religious end.¹⁰ Biological terrorism, interchangeably called bioterrorism, may therefore be defined as *the use or threatened use of pathogenic microorganisms or biologically-produced toxins by non-state actors to cause illness or death in civilian human, animal, or plant populations to accomplish an ideological, political, or religious end*. By casting our net widely in this manner we are able to study forms of biological terrorism that are many times more likely to occur than macroterrorism, and thus are at least as threatening as this well-explored type of bioterrorism.

If it is beneficial to cast our net widely and study a broad range of terrorist acts, then would we be well advised to include the other forms of Weapons of Mass Destruction in our analysis? Certainly many authors do not limit their analyses to one form of weapon of mass destruction, and most of the United States' counter-bioterrorism plans are also intended to reduce the threat posed by chemical weapons and nuclear or radiological weapons.¹¹ Furthermore, the threat posed by chemical and nuclear weapons is almost as great as the threat posed by biological weapons. The relative ease with which chemical weapons may be created and their predictable effects make a chemical attack much more likely to occur than a biological attack,¹² while the terrible consequences of a nuclear attack make such a thing just as undesirable as a biological weapons attack.

Nevertheless, the threat posed by biological terrorism is inherently different from the threat posed by chemical or nuclear/radiological weapons. For example, the technical constraints involved with creating an inhalable aerosol that have prevented certain terrorists from effectively deploying biological agents do not apply to chemical weapons. Likewise, while terrorist groups are unlikely to be deterred from using biological weapons if they cannot obtain assistance from a state, they would probably be unable to use nuclear weapons without assistance from a state.¹³

Responding to bioterrorism also involves issues that have no bearing on other forms of WMD terrorism. The utility of vaccinations, the possibility of large-scale quarantine,¹⁴ the stockpiling of antibiotics, the creation of biological agent detectors, and the domestic control of disease-causing agents are all issues that apply solely to the study of biological terrorism. Moreover, biological terrorism is many times more a public health issue than either chemical terrorism or nuclear/radiological terrorism because the medical sector would have most of the responsibility for responding to a biological weapons attack,¹⁵ while responding to chemical weapon terrorism and nuclear terrorism is more the responsibility of fire-fighters, the police, and the military.

Overall, the classification "Weapons of Mass Destruction" is not particularly useful for the purposes of this paper. Chemical and nuclear/radiological weapons are intrinsically different from biological weapons, and not all of the biological acts to be given consideration may be classified as massively destructive. For these reasons, throughout the course of this paper, biological terrorism will not be treated as just part of the threat of WMD terrorism, but as a threat unto itself.

After exploring the many facets of the bioterrorist threat, the first chapter will proceed to evaluate the threat of biological terrorism, first to the United States and then to Canada. The goal will be to discover which types of bioterrorist acts are most likely to occur in each state, and predict the likelihood of these incidents. Although the Canadian government has adjured its own analysts to produce a method of quantifying the bioterrorist threat, no attempt will be made to do so here. While quantitative analysis can be helpful when examining some trends in political science, it tends to be overused. When social scientists create a quantitative index to measure an essentially social concept such as the threat of bioterrorism, they do so to give their analysis a veneer of hard science, which makes any conclusions they draw seem more factually based and less open to questioning. Despite the authors' pretensions to scientific rigour, most quantitative indices are formulated with no more regard for the precepts of the scientific method than any other form of political analysis. The variables used in these indices are added together haphazardly, usually assigning equal value to all constituent variables with little consideration that one variable might measure a slightly greater portion of the concept than the others.¹⁶ Within the social sciences especially, the numerical values ascribed to each of the constituent variables are often assigned solely at the discretion of the researcher, with no concrete criteria to decide what these values should be. Most often the variables are added together and the numerical values assigned to them in a manner which best proves the hypothesis of the researcher.¹⁷

There is something inherently wrong with attempting to attach a simple numerical value to a multifaceted, complicated, and above all *social* concept like the threat of biological terrorism.¹⁸ Therefore, no attempt will be made to do so. Although the method used to analyze the threat of biological terrorism to the United States and Canada will be both systematic and rigorous, it will not be quantitative. What it may lose in parsimony and resemblance to hard science, it will more than gain in richness and depth of analysis.

Before concluding our discussion of the first chapter, a few caveats must be entered concerning the predictions and assessments to be made. As desirable as a comprehensive assessment of the threat of bioterrorism might be, we must resign ourselves to the fact that such a thing may in fact be unattainable. It is within terrorists' best interests that many of their activities remain undetected, so that they might further their causes without harassment from law enforcement agencies. Furthermore, many biological weapons may be produced using dual-use equipment in crude and quite undetectable laboratories no bigger than a small room. Thus, it should come as no surprise that even law enforcement agencies and intelligence organizations are not always aware of biological terrorists' existence until after they have begun an attack.¹⁹ Therefore, while it may be a simple matter to assess the threat posed by more visible weapons as developed by enemies who openly advertise their accomplishments in research and development (for example, the threat posed by Soviet nuclear missiles), the shroud of secrecy under which most bioterrorists would operate makes the task of assessing the threat posed by their weapons exceedingly difficult.

Our task is further complicated by the fact that intelligence organizations in both countries do not share all of the information they gather about terrorist organizations with the general public. (Though in all fairness, the representatives of CSIS who were interviewed for this paper were quite candid with all of their responses.) Obviously, it is in the best interests of their respective national securities for intelligence organizations to keep a few secrets out of the public domain.

However, when we base our analysis on incomplete information we run the danger of falling into one of two traps: First, we may assume that the lack of information is due to the absence of a threat, that the reason we have so little information on potential bioterrorists is because no such terrorists exist. Or, second, we may overestimate the threat by assuming that the reason we have so little information is because the bioterrorists are remarkably adept at keeping their activities hidden, but, we may further conjecture, these terrorists do exist and there may be more of them than we ever expected. One mistake leads to unreadiness in the face of a real threat, the other to paranoia and overexpenditure. These mistakes are made by governments as well as lowly political scientists. We should acknowledge the danger posed by both mistakes, and try to avoid making either.

Our analysis may be further hindered by the fact that biological terrorists tend to be irrational. Despite the fact that rationality on the part of all actors is assumed by many popular theories, this cannot be said to be the case in all instances, especially when dealing with terrorists. Jessica Stern writes

... if terrorists are calculating costs and benefits, it is hard to understand why politically motivated terrorism persists Despite the high ratio of damage and grief to the resources required for a terrorist act, terrorism has proved to be a remarkably ineffective means to accomplish anything.²⁰

Did the release of sarin gas in a Tokyo subway help bring about the end of the world, as the Aum Shinrikyo hoped it might? Have innumerable car bombs improved the lot of Palestine? If rationality is measured by whether an act helps bring about a desired end, then no terrorist act is rational, and neither are terrorists as perpetrators as such acts. We might further question the rationality of anyone who would use such a cruel and destructive weapon as disease-causing microbes in a terrorist attack.²¹

If terrorists in general, and biological terrorists especially, are irrational, it will be difficult if not impossible to accurately predict their behaviour all the time. Predicting

terrorists' behaviour involves determining what is in a terrorist group's best interests. For instance, we may predict that an anti-abortion terrorist group would not choose to perpetrate a massively destructive macroterrorist sort of incident because causing the deaths of hundreds of thousands of people is not in their best interests. But, if terrorists are irrational, we cannot be sure that they will also see that causing the deaths of hundreds of thousands of people is not in their best interests. Therefore, we cannot be certain that terrorists will always act in a manner that best serves their interests. Since predicting terrorists' behaviour necessarily relies upon what is determined to be in a terrorist group's best interests, our predictions are doomed to be periodically inaccurate.

It has been suggested that having some insight into the doctrine followed by terrorist groups would allow us to better understand their decision making processes, and thus improve the accuracy of our predictions.²² However, there are numerous accounts of law enforcement officials making the same mistake and assuming that just by reading up on a religious terrorist group's "core myth" they will understand precisely how the terrorists' minds work. In the course of negotiations, these officials typically underestimate the importance of some passages, and commit various mistakes that seem minor to outsiders but are quite offensive to the cultists.²³ Much to the surprise of the law enforcement officials, the negotiations will then break off and some variety of major disaster will ensue. Even after lengthy study of the group's doctrine, the logic behind their actions often remains incomprehensible to outside analysts. Knowing a terrorist group's doctrine gives very limited insight into their goals and actions.

Having determined which types of biological terrorism are most likely to occur in Canada and the United States in the first chapter, the second chapter will be devoted to evaluating both countries' responses to the threat of biological terrorism. This chapter will explore the major thrusts of each state's responses to the bioterrorist threat and offer some criticism of both countries' plans. Information about the American response plans covered

in the second chapter will be found in numerous General Accounting Office (GAO) publications, as well as articles from various academic journals. Information for Canadian responses will come from CSIS publications and interviews with representatives of those organizations responsible for Canada's counter-bioterrorism plans.²⁴

It should be noted that Canada's preparedness plans are very much still in their embryonic stages, at least when compared to the American response plans. For, while the United States identified WMD terrorism as a major threat to the United States in 1995, Canada has only begun to take this threat seriously since 1999.²⁵ The Americans have had a 4-year headstart to implement and refine their counter-bioterrorism programs. Most Canadian programs are still in their planning phases.

Criticism may be levelled at this thesis for focussing too intently on the threat to states when the threat of bioterrorism is anything but confined to states. If a terrorist group were to disseminate a contagious biological agent, the effects of this attack would probably not be confined to one state. Entire regions of the world, if not the entire planet itself, might be affected. So, is biological terrorism a global threat and not just a national threat? Similarly, can the threat of biological terrorism be said to be same to residents of Toronto as it is to the residents of Tuktoyaktuk? Likewise, is the threat to New York the same as the threat to Nome, Alaska? If the threat is not uniform within a state, should it be assessed as if it were?

Responses are not confined to the state either. Global initiatives to reduce the threat of Weapons of Mass Destruction terrorism, of which bioterrorism is a major part, are embodied in numerous United Nations (UN) treaties, such as those meant to suppress terrorist bombing offences and the financing of terrorist groups.²⁶ Individual cities such as Vancouver²⁷ and New York have developed, at their own initiative, extensive plans meant to help reduce the damage incurred during large disasters such as a bioterrorist attack. If the

threat is not responded to solely by states, should responses to the bioterrorist threat be analyzed on a state by state basis?

These observations are both valid. However, there are a few very real practical considerations behind this paper's focus on the threat to states and state responses to this threat. For even though there are a few examples of international and subnational attempts to reduce the bioterrorist threat, defending against the threat of biological terrorism is largely the responsibility of the state. The international community has proven to be remarkable ineffective at reducing the threat of biological terrorism.²⁸ Nor do subnational governments have the resources (military as well as financial) to provide adequate defence against this threat. Even the examples of United Nations treaties and city-level preparedness plans used just above to question state-centric analysis would not have come to pass without the initiative or ratification from national governments, or revenue from federally-raised tax dollars respectively.

The purpose of the third chapter will be to determine which state's responses are most appropriate for dealing with the threat of biological terrorism present in that state, thus answering the question posed at the beginning of this introduction. It may be found that one approach to the threat of bioterrorism is inherently superior to the other. It may also be found that both Canada and the United States are equally well prepared to meet the most likely forms of bioterrorism.

Regardless of which state is found to have the most appropriate response, it is unlikely that both will be found to have responded to the bioterrorist threat perfectly. Therefore, possible improvements for each country's responses will also be discussed during the third chapter. There is a possibility that both countries will be able to improve their own response by learning from the other's experiences in these matters. Consideration must also be given to the feasibility of such improvements, because even though one state's

responses may be shown to be entirely unsuited to the actual threat, ameliorating the situation may be next to impossible.

Notes to Introduction

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- ¹⁹"How Japan Germ Terror Alerted World," New York Times 26 May 1998, p. A10.
- ²⁰Stern, The Ultimate Terrorists, 78.
- ²¹Falkenrath, *et al.*, America's Achilles' Heel, 60.
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- ²³Jonathan B. Tucker, "Lessons From the Case Studies," in Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons, ed. Jonathan B. Tucker, (Cambridge, Massachusetts: MIT Press, 2000), 260-263.

²⁴Anonymous Source (Representative of Emergency Response Canada), interview by author, Ottawa (Canada), 13 October 2000.

²⁵Purver, interview

²⁶Badey, "US Anti-terrorism Policy," 56.

²⁷Anonymous Source, interview.

²⁸Leonard A. Cole, The Eleventh Plague: The Politics of Biological and Chemical Warfare (New York: W.H. Freeman and Company, 1997): 260-263.

Chapter One - The Threat of Bioterrorism to Canada and the United States

It is lamentably common among those who would wish to sensationalize the threat of biological terrorism to state, in quick succession, that it is possible to kill millions of people with a single act of bioterrorism,¹ and that biological weapons may be made in one's kitchen and disseminated by throwing lightbulbs filled with microbes onto subway tracks.² On the surface, both of these statements are quite accurate. However, they actually refer to two very different types of bioterrorism. Few analysts, politicians, or novelists acknowledge that biological weapons may be used in a variety of different acts. All of these varieties of bioterrorism can at the very least greatly disrupt a city, so discussing all of them with a view to preventing these acts is a worthwhile activity.

The broad definition of biological terrorism given during the introduction allows for a great variety of acts, ranging from hoaxes to macroterrorism, to be considered as bioterrorist events. In this chapter, the characteristics and relative likelihood of each of these events will be separately assessed. This is a departure from and improvement upon most assessments of the bioterrorist threat, which tend to concentrate on a single bastardized form of bioterrorism that possesses all of the worst qualities of the many individual forms. This practice has led to unrealistic assessments of the threat posed by the types of bioterrorism that are most destructive, but also more difficult to carry out.

This chapter will begin with a discussion of the many varieties of bioterrorism. It will start by showing that, although individual acts belonging to these categories may vary greatly in a number of ways, all acts belonging to one category are usually united by common characteristics such as technical constraints and motivational constraints. This chapter will then discuss each type in detail, paying particular attention to these commonalities.

However, an assessment of the bioterrorist threat cannot end with the relative ease with which various acts may be carried out. If it did, the threat to Canada and the United States would be shown to be identical, which is certainly not the case. Two other factors, relating to characteristics of the specific target states, also affect the likelihood of a bioterrorist attack.

The presence of terrorist groups, operating either domestically or abroad, who might wish to harm a state, its businesses, or some of its citizens can greatly affect the likelihood of certain kinds of bioterrorist events, depending on the terrorists' ability to surmount the technical and moral obstacles associated with each kind of act. For example, if no terrorist groups victimize a target state, the bioterrorist threat to that state can be said to be nonexistent. If a state is targeted by terrorist groups who are only capable of surmounting the technical and moral obstacles associated with hoaxes, the threat of hoaxes may be high, but the likelihood of other acts remains low. To gain a better understanding of the threat of bioterrorism to the United States and Canada, this chapter will discuss which kinds of terrorist groups operate within and against both states, and predict which of these groups are likely to be capable of carrying out the various types of biological attacks.

A state may possess other attributes that can affect its vulnerability to, or the likelihood of, certain kinds of bioterrorist events. Many scholars are aware of this and, in the absence of hard data regarding terrorist groups, many have based their assessments of the bioterrorist threat entirely on clichés about the infinite vulnerability of all open societies to terrorism. A state's vulnerability can greatly affect the likelihood of a bioterrorist act because a highly vulnerable state is a much more tempting target to terrorist groups intent on causing as much damage as possible. Nevertheless, vulnerability is not the only factor to consider when assessing the bioterrorist threat. A discussion of qualities possessed by states that might affect its vulnerability or the likelihood of a bioterrorist act will be used to round out our assessment of the bioterrorist threat.

Finally, this chapter will utilize the data generated by the discussions of the comparative vulnerabilities of the United States and Canada, the different terrorist groups present in each state, and the relative ease with which each type of bioterrorist event may be carried out to determine which state is more likely to be the victim of a bioterrorist attack, and which events are more likely to occur in each state. Knowing which state is more likely to be the victim of a bioterrorist attack and which events are more likely to occur will assist us in our task of determining which state's response to the bioterrorist threat is most appropriate.

The Many Faces of the Bioterrorist Threat

Although all bioterrorist acts are united by the involvement of biological agents and their use by subnational actors, these events may exhibit great variety in all of their other attributes. Terrorists may use dozens of varieties of pathogens, disseminated in any number of ways. These acts may end up killing thousands of people or none. The perpetrators may give a clear warning that they intend to release biological agents, or there may be no advance warning of an attack at all. Despite the infinite variety of possible bioterrorist attacks, all such events may be classified into seven broad categories united by a few common characteristics.

These categories are hoaxes; assassination and murder; small-scale attacks; product tampering; agricultural or agro-terrorism; non-lethal bioterrorism; and macroterrorism. Although there may be extensive overlapping between categories, all acts of one category will logically exhibit a few common traits, such as the use of a few select pathogens, and common measures of success (for instance, the amount of disruption created, or the number of people killed). However, the most important common characteristics exhibited by each type of act are the motivational and technical barriers associated with each. If a bioterrorist act is either technically or morally difficult it will be less likely to occur. A brief discussion

of the motivational and technical constraints associated with bioterrorism will further highlight the importance of these two factors prior to our discussion of the many types of bioterrorism.

Motivational Barriers

Depending on the type of act planned, there are a number of motivational barriers to be overcome before a terrorist group will decide to use biological weapons. Fortunately, very few terrorists are able to overcome any of them.³ Depending on the type of attack planned, a terrorist group must be willing to kill as many as several thousand people, or as few as just one person, using a method that usually produces a slow and torturous death. Some acts require the perpetrators to risk capture and brutal retaliation for their acts. Other acts require terrorists to run the risk of losing the financial and moral support of a "constituency of outside supporters."⁴ Terrorists contemplating the use of highly infectious or contagious agents run the risk of being infected with their own microbes. Finally, although some acts will undoubtedly generate great media attention, some covert attacks will not generate as much attention as a conventional bombing. Terrorists contemplating these acts must not be primarily motivated by a desire for attention. Motivational barriers such as these are what prevent most of the large, well-known, well-organized, and technically competent terrorist groups in the world from using biological weapons. The importance of such barriers should never be underestimated. As the technical capabilities of terrorist groups increase through increased access to the internet and the growth of biotechnology, these barriers are the only things that prevent subnational actors from using biological weapons.

Technical Barriers

Not all of the groups who are motivated to use biological weapons are capable of actually carrying out such an event. There are just as many technical barriers associated with the

various kinds of bioterrorism as there are motivational barriers. These obstacles have also prevented terrorists from using biological weapons.

There are significant technical obstacles associated with each step of biological weapons production. Acquiring microbes to be used in biological weapons production requires either money or skill and equipment. Many biological agents may be obtained from natural sources. For instance, anthrax may be obtained from the corpses of animals that died from the disease. *Clostridium botulinum* may be found in improperly canned foods. Ricin may be made from castor beans.⁵ Knowing where to find certain species of microbes requires limited specialized knowledge, and virtually no money or equipment. However, when one obtains microbes from natural sources, it is not possible to ascertain whether the strain recovered is sufficiently deadly, or if it is quite harmless to humans.

Biological agents also may be purchased from mail order houses such as the American Type Culture Collection (ATCC) in Maryland. Mail order samples usually only cost between 15 and 30 dollars US, and it is possible to verify the virulence of these samples by researching where the strains were obtained. Mail order houses now require their recipients of dangerous pathogens to be registered with the Centers for Disease Control and Prevention (CDC).⁶ This requirement opens the terrorists up to detection. If the mail order house or the CDC suspect anything is amiss with a request for highly dangerous pathogens they will inform the police of their suspicions.⁷ Ordering from a mail order house also requires a minimal outlay of cash and some specialized knowledge of which strains of pathogens are the most virulent.

The terrorist group may also attempt to steal samples from a laboratory. Laboratories that use highly infectious diseases are now so secure that the only way to steal biological agents would be to get a job at a lab and steal microbes when given the chance. The thief would need to be well qualified to get a job at a laboratory that has a supply of

deadly agents, so this method of acquisition would require much more skill than the first two techniques.⁸

If the terrorist group is unable to acquire the biological agent most suited to the type of attack it is considering, it may be forced to use an easier-to-acquire organism. For example, even though a large scale attack would work best using viruses like Marburg or Lassa Fever, these are not readily available, either from natural sources or from mail order houses or laboratories. The terrorists may be forced to use agents like anthrax, plant or animal pathogens, or non-lethal agents, which are easier to acquire, but may not be suited to the type of event the terrorists are contemplating. If they cannot obtain otherwise suitable agents, the terrorists may even be forced to choose to perpetrate a simpler form of bioterrorism.

Cultivating biological agents requires somewhat more skill and equipment than obtaining them. Cultivating bacterial, fungal, or rickettsial agents requires growth medium, beakers, petrie dishes, and some sort of an incubator where the samples may be kept in an oxygen-free environment at a constant temperature and humidity. Some knowledge of microbiology will be required to know exactly what mixture of growth medium is necessary, and what conditions are best to grow the microbes.⁹ Making spores out of the bacteria also requires an understanding of how slowly the agents should be introduced to drier conditions and oxygen.

Cultivating viruses is even more difficult. Viruses cannot grow in growth medium, but only in living cells. Some viruses may be grown in chicken eggs, but others are best grown in human and animal tissue cells. Some viruses must be grown in embryonic cells or in cells from a particular organ from a particular species of animal. These tissue samples are very expensive and hard to come by. Furthermore, attempts to acquire rare tissue samples from research supply companies in order to grow viruses are not often mistaken for anything else. If a terrorist group is unable to cultivate a sufficient number of microbes to

accomplish whatever task it has planned, it may be forced to consider a type of attack that requires fewer pathogens, such as murder.

Weaponization may be the most difficult task of all. While some acts require agents to be simply poured onto foodstuffs or injected into a person's or animal's bloodstream, others require more ingenious methods of dispersal. Both large scale and small scale aerosolization requires agents to be manufactured in such a way that their particles are smaller than five microns in diameter, so that they are small enough to enter the alveoli during inhalation, but greater than one micron in diameter, so that they are not immediately expelled from the respiratory tract during exhalation.¹⁰ Aerosolization also requires the agents to be prepared in such a way that they are not at risk of losing their virulence due to environmental stresses such as heat, desiccation, and UV radiation. So far, both requirements are beyond the limits of all subnational actors, and even a few national biological weapons programs. A device capable of dispersing these agents in particles that are smaller than the naked eye, and that will not become clogged with larger particles is also required. Infecting plants with a biological agent would require the contrivance of an innovative dispersal device.¹¹

There is debate about how much skill and money are required to produce the biological weapons necessary for each kind of attack. Some analysts say that \$10,000 is all that is required to purchase lab equipment necessary for the production of many bacterial agents;¹² others say that millions of dollars are necessary to fund a working biological weapons program.¹³ While some analysts state that anyone with a few undergraduate or even high school courses in biology has the necessary knowledge to manufacture biological agents,¹⁴ others say it requires a graduate degree in microbiology.¹⁵ The amount of money and skill required to acquire, cultivate, and disperse biological weapons actually depends on the type of agent used, and the kind of attack proposed. While drawing fluid from an anthrax infected corpse and injecting this substance into a murder victim requires virtually

no skill or money, disseminating a cloud of microencapsulated Rift Valley fever virus particles over a city requires huge amounts of both. If a terrorist group is unable to surmount all of the technical barriers associated with their desired type of attack, it may be forced to choose a type of act that is less ideally suited to its purposes, but is easier to accomplish.

It has been suggested that terrorists who do not have the technical skill necessary to produce their own biological weapons may hire a microbiologist previously employed by the former Soviet Union's extensive biological weapons program. Upwards of 70,000 people, so the argument goes, once worked at civilian and military institutions researching and producing biological weapons.¹⁶ With the cancellation of this program in 1993, thousands of these scientists and lab technicians were out of work. Some have been hired by private Russian research firms, but many remain unemployed or underemployed. These scientists, it is feared, may be hired by states with offensive biological weapons programs or international terrorist groups considering biological weapons use. Others may be recruited by cults. Other scientists still employed by the atrophied Russian biological weapons program may sell microbes or dissemination devices to rogue states or terrorists groups in order to supplement their meagre incomes. A terrorist group would likely need a lot of money to pay for the services of these highly specialized scientists, but this option obviates the need for any technical skill.

However, this problem is quite overstated. While there were indeed 70,000 people working in the Soviet biological weapons program, most of these were support staff and lab technicians. Only about 100 scientists ever had all the knowledge required to create a usable biological weapon from scratch.¹⁷ Furthermore, about 90 percent of all the former employees of the Soviet biological weapons program have been hired by relatively well-paying research laboratories in the United States, Western Europe, and Israel.¹⁸ If the same percentage of the 100 scientists with all the knowledge required to make a biological

weapon have also been employed in these countries, there are only ten scientists left in Russia with knowledge that might be of interest to terrorist groups or rogue states.

This problem is nowhere as large as we have been led to believe. Nevertheless, there is a very slim chance that these ten scientists have been hired by terrorist groups. If these former Soviet scientists possess any lingering feelings of hostility towards the United States, they may be quite sympathetic to terrorist groups who have a similarly low opinion of the U.S. They may be more willing to share secrets, perhaps at a discounted price, with these like-minded terrorists than with terrorists wishing to harm a more neutral state, for instance Canada. For this reason the United States is more likely to be the victim of a bioterrorist attack than Canada.

Another way to overcome these technical barriers would be to acquire a state sponsor. A terrorist group with biological weapons supplied by a state-run biological weapons program would have no need of technical skill or large financial resources. However, despite the fear these scenarios engender in American policy makers, the threat of state-sponsored terrorism is also rather overstated. Some reports indicate that even though so-called rogue states invest millions of dollars in secret biological weapons programs, none of them have been able to create an efficient aerosol dissemination device that is capable of producing mass casualties.¹⁹ State-run biological weapon programs are also unlikely to be willing to simply give away hard-won secrets, weaponized microbes, or ingenious dissemination devices that took them years to develop to subnational actors.²⁰ Furthermore, even though they may attest to having similar goals as their sponsors, terrorists, being irrational, are not the most trustworthy or predictable lot. State sponsors run the risk of having their proteges turn on them and attacking them with their own microbes.²¹ Finally, if it was revealed that a state sponsored an act of biological terrorism, this state could count on as much brutal retaliation as could be expected if that state used its own forces to perpetrate such an attack. If a state is even so much as suspected of colluding

with terrorists, it is immediately subjected to sanctions, which tend to last for decades.²²

The punishment for a successful bioterrorist act could be expected to be much, much worse. A state would either have to be very desperate or very foolhardy to sponsor bioterrorism.

Nevertheless, desperate and foolhardy states do appear once in a while. If any of these states was pushed to the end of its tether by crippling sanctions or a devastating war, it might have no other option but to use bioterrorism to have some impact on its assailant.²³

The motivational and technical barriers associated with each type of bioterrorist attack have a great effect on the relative likelihood of each act. Therefore, these two types of constraints should always be the first of our considerations when we examine the seven types of bioterrorist acts.

Hoaxes

A biological hoax may be defined as a false claim to have released biological agents.

Although this variety of bioterrorism involves no actual use of a biological agent, hoaxes may be quite disruptive, and thus their prevention is still a worthy goal. Mailing anonymous packages labelled 'Anthrachs' to businesses,²⁴ leaving suspicious but harmless packages in train stations, and having an anthrax threat telephoned in during one's thesis defence are all examples of biological hoaxes.

There may be hundreds of reasons to produce a hoax, ranging from wanting to have one's high school classes cancelled for the day²⁵ to a desire to frighten abortion doctors into discontinuing their practise.²⁶ However, all perpetrators of such acts are at least partially motivated by hoaxes' potential for disruption. Depending on its credibility a hoax may create as little disruption as the temporary evacuation of a small doctor's office, or as much disruption as the evacuation of an entire downtown core and the deployment of several hazardous materials specialists.

Executing a hoax requires no technical expertise whatsoever. Any individual who can find an address or phone number, and mail a letter or dial a phone can bring about a biological hoax. Having said that, if a terrorist is able to include technical-sounding information in a phone calls, or technical-looking ingredients like powdery substances or timers in mailed packages, the hoax may be lent greater credibility, thus creating further disruption. Known attempts to acquire or cultivate biological agents may also lend credibility to hoaxes.²⁷

Although no actual pathogens are involved, the perpetrators of hoaxes usually refer to just a few specific agents during their phone calls and messages. To provide a maximum amount of terror and disruption, these biological agents should be well-known to the victims for their deadliness. Anthrax, which is well-known to almost everybody for being quite virulent, is a popular choice for bioterrorist hoaxes. (Further properties of selected biological agents may be found in Appendix I.) Smallpox, which has recently received attention in the media for its potential to be used as a biological warfare agent,²⁸ may also be used. Other dangerous and well-known pathogens that might be referred to during a bioterrorist hoax are Ebola and AIDS. Terrorists who are well-versed in popular fiction might claim to have released a genetically engineered pathogen.²⁹

There are few motivational barriers preventing terrorists from perpetrating a bioterrorist hoax. Since these acts involve no actual release of agents, they are extremely unlikely to kill anybody (although deaths produced in panicked situations are not an unheard-of scenario). Therefore, any terrorist who is likely to be dissuaded by the prospect of being responsible for many deaths, either due to pangs of conscience or those of the people to whom the terrorists look for moral and financial support, will not be dissuaded from carrying out a hoax. Terrorists are not likely to be dissuaded by the possibility of brutal punishment either. The perpetrators of bioterrorist hoaxes are rarely caught,³⁰ and the punishment for such an act is often limited to a charge of mischief, wire fraud, or the

like. Since no microbes are involved, terrorists will not be discouraged by the possibility of being infected themselves. Rather, terrorists interested in creating terror and disruption are likely to be drawn towards biological hoaxes because they are very capable of being quite terrifying and disruptive.

Assassination and Murder

Murder with a biological agent may be defined as the discriminate use of a biological agent to kill a specific person or small group of people. Assassination with a biological agent is the same as murder except that the specific person is a public figure. The best way to murder someone using a biological agent would be to infect the target surreptitiously with an extremely virulent agent, and then let the disease take its course while giving absolutely no warning or indication that the illness is due to a biological terrorist attack until well after the disease has had its desired effect. Giving some indication that the victim's illness is intentional could assist in the assassins' apprehension and in the timely treatment of the disease, if law enforcement agencies are able to ascertain what agent was used, either from confessions of the attempted murderers or from evidence found in their headquarters. Neither apprehension nor effective treatment of the disease are in the best interests of the murderers.

The best agents to be used in a discriminate murder are ones that are extremely deadly and untreatable. So that the victim's doctors are not able to begin medical treatment in time to save the victim, the agent should also be fast-acting. So that investigators are not able to link the disease-causing agent to the assassins, the agent would ideally be untraceable and difficult to recognize. This could either mean that the pathogen is a toxin that denatures after only a short time in the body, or that it is so common that a bioterrorist attack is never suspected to be the source of this disease. Since indiscriminate deaths are not desired, logically, the terrorists would not use contagious agents.

Deadly toxins such as ricin and botulinum are ideal for murdering people.

Botulinum toxin is the most toxic substance known to man. One tenth of a microgram of botulinum toxin is enough to kill a 100 kg person. Approximately 3 milligrams of ricin are required to kill the same sized person. Treating botulism with an antitoxin is only really effective before the onset of symptoms. There is no antitoxin for ricin.³¹ All toxins are fast-acting (at least when compared with other biological agents; they are much slower acting than chemical agents). Botulinum toxin has been known to kill its victims in as little as 24 hours, while ricin kills within 36 to 72 hours. Because botulinum toxin denatures quickly in even slightly warm temperatures, it may be difficult to find the cause of death of a botulinum victim. Botulinum and ricin exist both in nature. This makes them readily obtainable, and any deaths produced by these agents may not be attributed to intentional poisoning.³² Finally, neither of these toxins are the least bit communicable.

Some deadlier bacterial illnesses might also be suitable for murder and assassination. Anthrax, which kills over 80 percent of the people it infects, is sufficiently virulent and is not contagious. A recent possible murder involving anthrax-laced heroin shows that when contracted subcutaneously anthrax can kill quickly and gruesomely, despite a correct diagnosis and a concerted if belated effort at antibiotic treatment.³³ Glanders, typically found in horses, mules, and donkeys, is also quite virulent. Like anthrax it may be found in nature, and it is not usually transmittable.³⁴

Acquiring these bacteria requires a moderate amount of technical skill. Both are available in nature: anthrax may be found in the corpses of animals that have died of anthrax, while the bacterium that produces glanders, *Burkholderia mallei*, may be obtained from ulcerating skin lesions on infected horses, donkeys, and mules.³⁵

Cultivating these pathogens requires significant technical skill even though minimal amounts of these substances are needed to kill a single person. Some specialized knowledge of microbiology is necessary to provide the correct conditions necessary to make

sufficiently virulent microbes. "Even minor variations in their (the bacteria's) parameters ... could seriously degrade their intended performance."³⁶ *Clostridium botulinum* is especially known for being difficult to cultivate. For example,

Dr. Jerzy Mierzejewski, the retired director of the Polish biological defense laboratories at Pulawy who spent his entire professional career working with *Clostridium botulinum*, plaintively expressed his persistent difficulties on working with the organism One culture cycle would produce toxin that was lethal and a few months later the next would not, and so on over the years.³⁷

One way to avoid the problems associated with cultivating bacteria would be to use a hypodermic needle to extract several millilitres of fluid from the corpse of an animal that recently died of anthrax, or from the lesions on glanders-infected horses. This fluid will be full of disease-causing microbes. The same needle would then be used to inject a murder victim with the pathogen-filled fluid. This method requires no skill at cultivation, but it only produces enough microbes to kill a single person, rendering it unsuitable for other biological acts.

Disseminating these bacterial agents requires minimal technical skill. To ensure that anthrax or glanders is contracted solely by the desired target, the best way to disseminate these bacteria is through some sort of injection. Dissemination by aerosol spray is sufficiently lethal; however, the aerosol route presents the significant risk of infecting other people. The gastric and cutaneous routes of infection are not usually fatal for either anthrax or glanders.³⁸ The diseases may either be injected with some variety of hypodermic needle or through contact with skin abrasions. Numerous simple devices, ranging from umbrellas tipped with pathogens³⁹ to laced heroin that the victim itself will inject into his or her own bloodstream, may be easily devised.

The toxins may best be disseminated by poisoning the victim's food or water. Spreading the deadly toxins on objects that the victim is likely to come in contact with,

such as doorknobs or cutlery, is also an option. However, the assassins must be certain that the victim will touch his or her mouth or nose soon after touching the toxin-coated object because the toxin will have little effect on the unbroken skin of the victim.

There are few motivational barriers preventing murder or assassination using a biological agent. Although the possibility of being incarcerated for murder might deter a few terrorists, the untraceability of botulinum toxin combined with the probability that any deaths produced by botulism may be attributed to accidental food poisoning could convince many terrorists to take the chance. Morally, committing murder with a biological agent is much easier than many other biological acts. Only one person, whom the terrorists will presumably believe deserves to die, will be killed. There are no indiscriminate deaths at all. Some potential terrorists may be dissuaded from using biological weapons to commit murder by the possibility of being infected by their own microbes while working with the pathogens. However, murder presents less danger to terrorists working with biological agents than most other acts. Any terrorist group that looks to a sector of the population for moral and financial support may be dissuaded from using biological agents to commit murder, due to the stigma attached by virtually all societies to any biological weapons use. Nevertheless, if the terrorists are able to convince their 'constituents'⁴⁰ that they are not responsible for the convenient death of their victim, or if their constituents feel that the victim deserved to die, they might still commit murder using biological agents. Finally, if a terrorist group's main goal is to produce terror, it is improbable that they will commit murder with a biological agent. A single death, be it mysterious or not, is not usually sufficient to create widespread terror. If the terrorists are particularly clumsy, a few innocent people might be killed by ingesting poisoned food or water meant for the victim. The prospect of killing of innocent bystanders could be quite undesirable to murderers who want to produce only one discriminate death. This might dissuade them from using biological agents to commit murder.

Using biological weapons to commit murder is an option open to many terrorist groups and even individuals. The technical obstacles involved with producing toxins may be overcome by small groups or individuals, while anybody capable of overcoming the motivational obstacles normally associated with conventional murders would likewise be able to overcome the motivational obstacles involved with this kind of bioterrorist act. Any terrorist group that believes the death of one person will solve its problems but does not wish to create widespread terror might be tempted to use biological weapons to murder someone.

Small Scale Attacks

A small scale act of bioterrorism is the use of a biological weapon to kill a small number of people. Unlike murder, a small scale act of bioterrorism is intended to create terror and kill indiscriminately. Unless it is an experiment with tactics or pathogens, a small scale attack would usually be extortive in nature. An act of extortion is meant to convince people to alter their behaviour for the benefit of the extortionists. The act may be intended to convince businesses it is too dangerous for them to continue using objectionable practises, persuade governments to withdraw their forces from a state, or force a group to pay the terrorists a large amount of money. The casualties created by such an act are rather incidental; success is measured by the number of people watching the act and whether the target submits to the demands of the terrorist group.

Many acts classified as other kinds of bioterrorism may also be extortive in intent. Most acts of agro-terrorism would probably be extortive in intent, as would acts of product tampering. Non-lethal attacks and hoaxes might also be extortive in nature. However, since terrorists involved with murder or macroterrorism have no other demand of their victim than that they die, these acts are never extortive.

A characteristic common to all extortive acts of terrorism is a warning or assertion of responsibility attached to a list of demands. How can the victims alter their behaviour in the desired way if they do not know what their attackers want them to do? These claims of responsibility have the unintended effect of helping law enforcement agencies apprehend the terrorists, and they might also give investigators a fairly clear indication of what agents are used. Whether these messages are delivered by telephone, computer, or regular mail their source may be traced. A claim of responsibility may also be used as damning evidence in a trial. Thus, the need to claim responsibility in order to make sure one's victims submit to one's demands is the Achilles heel of all extortive terrorist attacks, including the vast majority of small scale attacks.

Small scale extortive bioterrorist attacks may be thought of as a logical extension of the conventional bomb. Terrorists who desire public attention, such as those who engage in acts of extortion, are quite concerned with precedent.⁴¹ Terrorists tend to copy other terrorists' tactics. If a terrorist group succeeds in gripping the public's attention by carrying out a specific kind of act, other terrorists will copy them in order to gain a similar amount of attention. To make sure that "a lot of people (are) watching,"⁴² they will always make their acts slightly more spectacular than the last successful one. Terrorists will continue using a particular method, be it airplane hijacking or car bombs, forever increasing the amount of damage produced, until the act is no longer capable of attracting public attention or until methods have been devised to prevent this act.⁴³ Although terrorists are still overwhelmingly devoted to the Kalashnikov and the car bomb,⁴⁴ should the media and the public ever become bored with these methods, or if it becomes possible to prevent these actions, it is not inconceivable that terrorists will turn to bioterrorism

Besides usually being extortive, a small-scale attack will be characterized by the simple but innovative manner in which it is carried out. Complicated dissemination devices and laboratories are beyond the financial reach of most extortive terrorist groups. The

agents used will have been acquired in a simple but innovative fashion, such as taking them from natural sources or stealing them from a laboratory. Information required for the production of the biological weapons will be accumulated from a variety of open sources, such as the Internet and biology textbooks. The microbes will have been cultivated using inexpensive, readily available equipment. The device used to disseminate them will likewise be simple but ingenious, such as a commercially available fog machine or humidifier, or even the oft-used example of a lightbulb filled with pathogens thrown onto subway tracks.⁴⁵

In order to engage as much public attention as possible, which helps convince a target to take a terrorist's demands seriously, small scale terrorists should use agents whose infectiousness and virulence are widely known. Using an agent that is well known fosters the fearful atmosphere that the terrorists would like to produce. Again anthrax, which is quite well known for being infectious and deadly even in small amounts, tops the list of suitable agents. Anthrax is also suitable for inexpensive small scale attacks because it may be obtained from the corpses of animals that perished from the disease. It is relatively easily produced and it is not likely to lose its virulence after accidental exposure to the environment as might occur during improper handling. No other microbes are equally infamous for being deadly and easy to produce. Smallpox, AIDS, and Ebola each have some notoriety; however, creating a viral biological weapon is beyond the capabilities of the vast majority of all terrorist groups. An easily produced toxin such as ricin might also be used. However, ricin's deadly properties are not as celebrated as anthrax's.

Although anthrax and ricin may be obtained from natural sources, it is difficult to ascertain the virulence of strains of pathogens obtained from the environment. For this reason, the agents deployed in a small scale attack may turn out to be quite harmless.⁴⁶ The homemade and simplified methods used to cultivate microbes for this sort of attack may also reduce the virulence of the pathogens.

There are two basic ways for these pathogens to be disseminated in a small scale attack. Ricin is best disseminated through food or water contamination. This requires no technical skill, only enough daring as is necessary to pour a tiny amount of the deadly toxin into a water cooler, on a pop can, or on a sandwich. Food and water contamination is also a possible method of disseminating anthrax. However, it is most efficiently disseminated as an aerosol. As already mentioned, disseminating a biological agent in aerosol form has proven to be beyond the grasp of all subnational actors so far.⁴⁷ The technical difficulties associated with acquiring lethal strains of microbes, cultivating, and disseminating them makes it unlikely that a small scale attack will be able to kill more than a very small number of people, if anybody at all.

There are significant moral constraints associated with bringing about the death of even a few innocent people. Although using biological weapons would certainly give a terrorist group its desired level of public attention, a terrorist group's constituency might not approve of using biological agents to kill innocent people. Terrorists may be dissuaded from conducting this sort of attack in order to retain their constituency's necessary moral and financial support. The retaliatory response that could be expected to follow the death of a group of innocent people might also deter terrorists from engaging in this sort of act. The fear that they themselves might contract highly infectious anthrax or accidentally consume deadly ricin might deter others.

Even though a small scale terrorist attack would only produce a few deaths, probably no more than ten, or at the very most a hundred, it may have far reaching effects if the target submits to the demands of the terrorists. Not only would the target have to incur significant losses, but other terrorist groups might realize that using biological weapons for extortion is an effective means of accomplishing their malicious ends.⁴⁸ More terrorist groups would follow this practice, again making their biological attacks successively more damaging until there is nothing small about the scale of these attacks.

Product Tampering

Similar in many respects to both assassination and small scale attacks is product tampering. Like product tampering, murder and small scale attacks may involve the lacing of foodstuffs with deadly pathogens. However, product tampering may be distinguished from both by the fact that this act is intended bring about the financial ruin of a business or, if the business is particularly important to the economy of its homeland, an entire state.⁴⁹ An act of product tampering's success is not measured by the number of deaths it brings about, it is rather measured by whether the act creates significant financial problems for its intended victims.

Such an act would probably involve the contamination of a product with lethal or non-lethal pathogens in a way that allows the microbes to be ingested or inhaled. This product might be foodstuffs, bottled liquids, pharmaceuticals (though probably not antibiotics, for obvious reasons), cosmetics, perfume that does not contain alcohol, or even clothing. These products might be contaminated where they are produced or packaged, or even in the stores where they are to be sold. A note describing what products have been tainted might follow the contamination if the terrorists doubt that investigators will be able to figure out what the source of the emerging illness is. No issuance of demands is necessary because consumers will unintentionally carry out the wishes of the terrorist group. As soon as the public knows, or even suspects, which products have been contaminated, they will stop buying this product.⁵⁰ It will be removed from the shelves wherever it is sold and likely recalled by the manufacturer. Even though the producer or store might conduct a thorough investigation and discard any products that have even the slightest chance of being contaminated, the damage will be irreversible. Not only will the producer and seller incur crippling short term losses from having to discard many times more products than were actually tainted, they will have to endure significant long term

losses as a result of having their name blackened by this act. For years consumers will be disinclined to purchase the once tainted products just because they associate the brand name with the product tampering incident. Under this sort of pressure, a business whose products have been contaminated would either be forced to endure significant long term losses or even go out of business altogether, which is exactly what the terrorists want to happen.

Like some acts of murder and some small scale attacks, an act of product tampering would usually involve the use of biological toxins. However, botulinum itself would be unsuitable because it denatures within 12 hours.⁵¹ This might not be enough time for the tainted product to reach the consumer. In this case, *Clostridium botulinum*, the hardy bacterial spores that produce botulinum toxin, might be a more suitable candidate.⁵² Ricin is stable, easy to produce, and deadly. Trichothecene mycotoxins are rather difficult to obtain and cultivate, but are likewise stable and deadly.⁵³

Many varieties of bacteria might also be used to infect foodstuffs. *Yersinia pestis*, the bacteria that produces plague, may survive for weeks in moist meals; however it is rather communicable and, unless the terrorists are amenable to creating an epidemic as a side effect of their attempt to bankrupt a business, it probably will not be used. Tularemia can survive for years in frozen meats and liquids and Q fever can survive in milk.⁵⁴

If clothing is to be contaminated, a hardy bacterial spore should be used. The spores should be able to survive on the dry cloth fibres without being denatured by any of the mild chemicals typically sprayed onto new clothes. The spores should also be capable of infecting cutaneously or of becoming dislodged from the cloth fibres and being inhaled. Hardy anthrax once again tops the list of suitable spore-producing bacteria. Its spores can survive on wool fibres for decades. Like anthrax, *Coxiella burnetii*, the bacteria that produces Q fever, is highly infectious when inhaled and is greatly resistant to environmental stresses.⁵⁵ Even though it is available from infected cattle, it is considerably rarer than anthrax.

Since many of these potential agents, including anthrax, *Clostridium botulinum*, and ricin are available from nature, acquiring a pathogen to use in product tampering should not present a problem to most terrorist groups. They might, however, have some trouble finding a suitably virulent strain. It is not necessary to contaminate a large number of products to ruin a company financially, so only a small amount of toxin or bacteria has to be cultivated, though more than would be necessary to kill an individual. This will be marginally more difficult than cultivating enough pathogens for a murder or assassination. Producing bacterial spores requires some skill and knowledge about exactly how the spores should be dried. Disseminating these agents requires no skill whatsoever, and only enough boldness as is necessary to enter a factory or store and spread a minute amount of toxin or bacterial culture on a product. While pharmaceuticals and some foodstuffs are now packaged under relatively secure conditions, the same cannot be said for cosmetics, clothing, or perfume.

Still, the possibility of being caught while contaminating a product might deter a few terrorists from carrying out this sort of attack. The possibility of killing several innocent people might deter still more. Any terrorist group that does not wish to be caught or actually kill people may *falsely* claim to have contaminated a product. This sort of hoax would certainly have a detrimental effect on the target business, however, it is unlikely to have the same long term crippling effects that an actual release of disease causing agents would. A terrorist group that looks to the public for support might be deterred from this sort of act because they could expect their supporters to lose whatever sympathy they had for the terrorists. The media attention that such an act might elicit, however, could actually encourage some terrorists.

What terrorist groups possess the minimal technical skills, the desire to ruin a company financially, and the ability to overcome the above motivational obstacles required to taint consumer products with biological agents? Sadly, many terrorist groups possess these qualities. Even individuals have the ability to carry out this sort of attack. Many

terrorist organizations, especially those concerned about animal rights or the environment, consider some business practises reprehensible and worth punishing. Some animal rights groups might decide to contaminate cosmetics or perfumes produced by companies that test their products on animals. Some environmental activists might decide to contaminate beef or wool produced by companies that contribute to rainforest degradation. Businesses that do not conform to ideals put forth by religious or ultra right-wing terrorist groups might also find themselves at the receiving end of such an attack.

The damage done by an act of product tampering would not be limited to a few people sick or dead, and a single business destroyed. As already explained, if the business is important to economy of a state, that country's entire economy might be damaged. The businesses with which the ruined company interacted might also suffer. Such an act would highlight an unnerving lack of security within the target industry, and businesses within the same sector would be forced to create expensive new security measures to ensure the future safety of their products.

Agricultural Terrorism

Like product tampering, an act of agro-terrorism would often be intended to harm a business or even an entire economy. Unlike any other kind of bioterrorist act, agro-terrorism involves the use of animal and plant pathogens to sicken or kill crops or livestock.⁵⁶

This form of bioterrorism shares many properties with product tampering. Like many cases of product tampering, if an agro-terrorist thinks that investigators will be unable to trace the source of the disease, a message letting the public know that the attack has taken place would follow the poisoning. To make such an incriminating note unnecessary the terrorist group might decide to use microbes that are not enzootic to a region. To heighten the fear the public is meant to feel the terrorists might decide to use zoonoses,

which are simply microbes that can infect both animals and humans.⁵⁷ If the public is aware that the disease may be transferred to humans they will be extremely thorough in their eradication of all potentially infected animals.

"A country that has its crops infected with diseases... is eliminated from export markets almost immediately."⁵⁸ Even after the disease outbreak has been contained, overseas and domestic buyers will be wary about buying animal or plant products from a recently infected country. This will lead to significant losses in this sector of the economy, possibly for several years. If the crop is important to the economy of the affected country, such as coffee is to many third world countries and wheat is to Canada and many Middle Eastern countries, a bioterrorist attack of this nature could prove significantly detrimental to the entire country.⁵⁹ Such an attack might even lead to a famine accompanied by as many human deaths as might ever occur during an anthrax or smallpox attack.

While most crop and livestock poisonings would be undertaken to ruin a business or even an entire sector of an economy, some poisonings might be executed in order to destroy a variety of plant or animal that terrorists find objectionable for whatever reason. For example, some terrorists might decide to poison a crop of genetically engineered vegetables, tobacco, or coca plants. If the terrorists are quite disinterested in bringing about economic ruin and are only interested in bringing about the death of a particular organism, they will not give any public notice of their activities, again because doing so might assist law enforcement agencies to apprehend them and give investigators a better idea about which pathogens were used in the attacks, which might help botanists and veterinarians to curb the disease outbreak. If terrorists just want the offending organisms to die, they will try to make the epizootic seem as naturally occurring as possible, using diseases that are enzootic to a region, and inconspicuous dissemination techniques.

Fungal diseases such as wheat smut, coffee leaf rust, late potato blight, or wheat rust could be used to contaminate various important staple and export crops. These diseases are

resistant to environmental stresses, making them easy to cultivate, pose little danger to scientists working with them, and can be responsible for significant crop losses. It is possible to grow rust- and smut-resistant cereal crops; however, these plants tend to lose their resistance within two years.⁶⁰ Rust and smut outbreaks occur regularly in wheat producing areas around the world,⁶¹ so any terrorists wishing to use these spores would be well advised to publicly take credit for the outbreak if they do not wish it to be mistaken for a natural epidemic. Samples of these fungal spores may be obtained from discarded infected crops, or they may be stolen from a research laboratory. Security at plant disease research firms is much laxer than that at human disease research institutes. Since these diseases present no direct threat to humans, samples of these diseases may be more easily obtained from mail order houses, and their transfer is not controlled by the CDC. Cultivating these microbes requires a specialized knowledge of plant pathology and microbiology that may be beyond many terrorist groups. Dissemination of these agents requires the use of innovative methods such as dumping large amounts of feathers coated with fungal spores over crops.⁶²

Suitable agents for livestock poisoning include the zoonosis psittacosis, or parrot fever, which targets chickens; the ubiquitous anthrax and Q fever, both of which can infect people, sheep, and cattle; Venezuelan equine encephalitis and Glanders, which can kill people, horses, donkeys, and mules.⁶³ It is even possible to weaponize rabies⁶⁴ and mad cow disease (which is also a zoonosis). Since these diseases are also harmful to people, it will be more difficult to obtain them from mail order firms than plant illnesses. Cultivating a large amount of any of these microbes is not necessary because it is possible to infect only a small number of animals and still cause devastating economic damage. Zealous farmers will likely euthanize entire herds of livestock themselves in order to check the progress of the disease. Like plant pathogens, cultivating animal microbes would require some specialized knowledge of veterinary pathology, although this field is much closer to human

pathology than plant pathology. Disseminating these pathogens will likely be quite simple. Security around large ranches has never been particularly tight. It would be quite simple to sneak onto a farm and either inject a few animals with the disease, or contaminate an untreated surface water supply.

There are relatively few motivational obstacles constraining terrorists from executing this sort of attack. The punishment for killing plants or animals is never as severe as the punishment for murder. Likewise, while killing a human being would be abhorrent to many terrorists, many terrorists would not have much of a moral objection to killing animals or plants. Terrorists in need of widespread attention might be deterred, however, by the lack of concern the public might exhibit over the deaths of animals or plants.

Few terrorist have the specialized knowledge of plant and animal diseases necessary to poison crops or animals, and fewer still would be interested in killing large numbers of plants or animals. Some religious and millenarian groups whose doctrine makes reference to plagues might decide to release either plant or animal pathogens, thus inducing their own Apocalypse.⁶⁵ Politically motivated terrorists might decide to use agro-terrorism to ruin the global market for an enemy state's major export products. Perhaps surprisingly, some environmental groups might consider agro-terrorism. If an environmental activist group believes that an introduced species, such as cattle or coffee, is harmful to either native plants or animals, it may decide to use biological weapons to poison this crop or animal species.

Non-Lethal Bioterrorism

Non-lethal bioterrorism is a rather anomalous category. While all other categories would ideally involve the use of deadly pathogens, this one involves the intentional use of non-lethal agents. The victims of such an attack are not intended to die; they are just supposed to be incapacitated for a short time. It is difficult to say why a terrorist group would prefer its

victims to be incapacitated when producing and disseminating deadly pathogens requires no more skill or resources.⁶⁶ Perhaps in some cases such an attack would be intended to burden a state with the costs of caring for a large number of sick people.

There has only been one recorded instance of an intentionally non-lethal attack. In 1984, the Rajneeshee cult in The Dalles, Oregon poisoned 751 people, by contaminating ten local salad bars with *Salmonella typhimurium* bacteria, in order to prevent them from voting in a local election. The leader of the Rajneeshee cult, known as the Bhagwan, told the cult members who came up with the idea of poisoning people prior to the election that "it was best not to hurt people..."⁶⁷ The cult was similarly deterred from using *Salmonella typhi*, which could create a typhoid outbreak, by a concern that the fever produced by typhoid would last much longer than was really necessary to affect the outcome of the election. The choice of *typhimurium* was also affected by the fact that the cult's research laboratory could easily obtain this pathogen because it was "one of the control organisms used to meet the requirements for quality assurance expected of licensed clinical laboratories."⁶⁸

It would seem then that the Rajneeshees' choice of an incapacitating agent was due to the ease with which such substances may be obtained and a curious desire to do no permanent or even long-lasting harm. Besides influencing an election, there may be hundreds of reasons to use non-lethal agents. Who among us has not wished for the illness of a professor on exam day? A non-lethal act might also be conducted in order to surreptitiously test bacterial production and dissemination methods prior to a lethal attack. A terrorist group might use a non-lethal attack to demonstrate to an audience that it has the technical expertise necessary to make deadly biological weapons, thus assisting in its attempts at extortion without actually having to kill anyone. These acts might have the unintended consequence of killing a few already sick, old, or very young people. This would not be in the best interests of terrorists who would prefer their victims to recover; nevertheless, it is a possibility they all should consider.

Since we have so few examples of this sort of act, it is hard to say with certainty why a terrorist group would settle for just making people ill. However, it seems to be the case that if a terrorist group has qualms about killing people, it might decide to use an incapacitating agent to achieve its ends, whatever they are. Conceivably, it is possible to replace the deadly agents normally and ideally used in all sorts of bioterrorist attacks with non-lethal ones.⁶⁹ However, these diluted attacks would probably have a smaller impact and might be less successful. For instance, less terror would be created by the use of an agent known to be non-lethal, and any individual 'murder' victims would only be incapacitated for a short time. However, non-lethal bioterrorism remains a definite option for those groups that are unable to discard all of their morals.

There are innumerable pathogens that could be used in a non-lethal attack. The agent used depends on the sort of attack to be conducted. Salmonella and staphylococcal enterotoxins might be used to contaminate food or water supplies. Brucellosis could be used in an airborne attack.⁷⁰ Although acquiring these agents from a laboratory or mail order house would be significantly easier than acquiring deadly pathogens from the same source, cultivating and disseminating them requires skills similar to what is needed to cultivate and disseminate deadly pathogens during small scale attacks, product tamperings, or any other variety of bioterrorist attack.

Refraining from killing opens non-lethal bioterrorism to a number of groups that might otherwise be deterred by having to kill people. The possibility of punishment, which is likely to be limited to a charge of assault and conspiracy,⁷¹ is less likely to deter terrorists. The possibility of being infected themselves with a non-lethal agent would deter fewer terrorists than the possibility of being infected with a lethal agent. Nevertheless, this sort of act would definitely engage less public attention. This fact might deter the legions of groups who want to draw public attention to their cause. The use of any sort of biological agent, lethal or not, would probably be undesirable for many terrorist groups who rely on an

outside constituency for support. Still, many terrorist groups, not just cults wishing to influence elections, might consider non-lethal acts. Indeed, any terrorist group without murderous intentions, and which does not need a lot of attention or outside financial or moral support could consider this option.

Macroterrorism

Macro-/mega-/super-/ultra-/mass casualty-terrorism⁷² is all the same thing, regardless of the hyperbole used as a prefix. This is the sort of terrorism most often written about in novels, and the kind that concerns politicians the most. Macroterrorist attacks will not be accompanied by any statement of demands because their perpetrators want nothing more from their victims than their deaths. The point of macroterrorism is to kill as many people as possible, preferably more than a thousand or even a million. Unique among acts of bioterrorism, the success of a macroterrorist act is measured in body counts.

Why anyone would want to kill thousands of people is a difficult question to answer. Killing millions might be motivated by a desire to bring about some sort of Armageddon, such as might be commanded in a group's religious or millenarian doctrine.⁷³ Mentally ill individuals, such as schizophrenics or sociopaths, might also contemplate such an act. In order to perpetrate an act of macroterrorism, terrorists must be willing to lose whatever outside moral and financial support they previously enjoyed. They must be willing to risk being infected themselves with a deadly agent. Finally, they must be aware that the punishment for such an act would likely be brutal and deadly.

Fortunately, very few terrorist groups have the technical skills and resources necessary to kill millions of people. To kill as many people as possible, it is best to use the most infectious, the most communicable, and the most virulent microbes available. These include viral hemorrhagic fevers such as Marburg, Ebola, Lassa fever, Rift Valley fever, and hantaviruses.⁷⁴ All of these agents act quickly, and kill between 50 and 90 percent of

their victims regardless of treatment. They may infect their victims through contact with bodily secretions, or via infected mosquitoes, and it is possible that some of these poorly understood viruses may infect humans through the respiratory tract.

Samples of these viruses are not typically available from natural sources, laboratories, or mail order houses, nor are viruses particularly easy to cultivate. Furthermore, a huge amount of microbes would have to be cultivated in order to infect several thousand people. If the terrorist group is unable to cultivate viruses or obtain samples of these rare diseases, it might be forced to use a lesser pathogen. *Yersinia pestis*, the bacteria that causes plague, might be used. In the form of pneumonic plague it apparently kills 100 percent of the people it infects, and it is quite contagious. However, an adequate vaccine exists for this disease.⁷⁵ Anthrax too is sufficiently deadly; however, it is not particularly communicable. This severely limits the amount of damage an anthrax attack can do.

Creating a device to efficiently disseminate the organisms requires an incredible amount of specialized technical skill. For the vast majority of all pathogens, the deadliest route of infection is through the respiratory tract. A pathogen must be made into an aerosol in order to infect people through this route. However, as has already been shown, creating an aerosol spray out of microbes and inventing a dispersal device for the spray is beyond the capabilities of the vast majority of all subnational actors right now.

Each step of the process of acquiring, cultivating, and disseminating the deadly microbes necessary to bring about the death of millions of people requires specialized skill, equipment, a large staff, and great financial resources. Few terrorist groups would ever be able to surmount these obstacles. These technical constraints, combined with the moral obstacles described above, make macroterrorism the least likely form of bioterrorism.

It seems then that some bioterrorist acts are much easier to accomplish than the well-publicized macroterrorist incidents we have been led to fear. Some incidents, such as

hoaxes, murders, small scale attacks, and product tampering are technically easier to accomplish, while others, including non-lethal bioterrorism, agro-terrorism, and murder again involve fewer moral constraints than macroterrorism. Appendix II summarizes the moral and technical constraints associated with each type of bioterrorist act.

This appendix also lists which types of terrorist groups would probably be interested in these acts, based on their ability to overcome technical and motivational obstacles. The second section of this chapter will also discuss which types of terrorist groups, as are present in Canada and the United States, might be capable of committing various acts of bioterrorism. A well-rounded assessment of the bioterrorist threat must include some reference to the likely perpetrators of the event. The form that a biological terrorist event takes and the success of such an act depends a great deal on the terrorists' goals and capabilities.

This section will begin with a description of the terrorist groups, operating either domestically or internationally, who have pitted themselves against the Canada and the United States (or residents or businesses operating therein), with a view to ascertaining which state is more threatened by which types of terrorist groups. A summary of these findings may be found in Appendix III. This section will then attempt to determine which broad categories of terrorist groups should logically gravitate towards which types of bioterrorism, based on their respective goals and their ability to overcome technical and motivational obstacles. This will allow us to ascertain which state is more at risk of being the victim of the various types of bioterrorist attacks.

The Potential Bioterrorists

The bioterrorist threat to Canada and the United States begins with the presence of terrorist groups that might wish to do either country harm. Most of the world's terrorist organizations have some sort of presence in both countries. In fact, Canada is second only

to the United States in the number of terrorist groups operating within its borders.⁷⁶

However, not all terrorist organizations operating within a state have any desire to do it harm, and not all terrorist organizations wishing to do a state harm must be found in that state. They may also operate from bases abroad.

Canada and Canadian businesses are threatened by single issue terrorist organizations, such as animal rights organizations, including the Animal Liberation Front (ALF) and the Justice Department; environmental terrorists, such as The Earth Liberation Army and the Sea Shepherd Conservation Society; and some anti-abortion terrorists.⁷⁷ Lately, Canada's environmental extremists have been more active than extremists in the United States. Environmental extremists have been responsible for explosions at a British Columbia logging bridge in 1995, and at an Alberta logging facility in 1997. While most of the environmental extremists' violent activity has been limited to tree spiking and equipment sabotage, some have been suspected of sending razor blades supposedly coated with poison or AIDS-infected blood to logging companies and hunting outfitters. Canada's animal rights activists have been less active than their American counterparts. However, the Animal Rights Militia is known to be responsible for false claims of product tampering. In 1992, they claimed to have contaminated candy bars with oven cleaner, and in December 1994, they claimed to have poisoned turkeys in Vancouver, causing over a million dollars in lost revenue.⁷⁸ Canada's anti-abortion activists are significantly less virulent than their American counterparts. While American anti-abortion crusaders have killed five doctors and abortion clinic staff, and wounded eleven since 1993, only three Canadian doctors have been wounded. However, Canadian pro-choice activists are worried that anti-abortion violence in Canada may soon escalate to American levels.⁷⁹

Canada has also become a refuge for American militia groups and international terrorist groups such as the Liberation Tigers of the Tamil Eelam (LTTE), the Provisional Irish Republican Army (PIRA), Hizballah, the Kurdistan Workers' Party (PKK), Mujahedin

e-Khalq (MEK), Algeria's Armed Islamic Group (GIA), and Hamas.⁸⁰ However, these groups have no desire to do Canada or Canadians any harm, but are here to plan, raise funds, acquire weapons, and recruit new members. Such groups would only conduct attacks in their own region of interest, and never in their safe haven.⁸¹ This does not mean that these groups do not threaten the safety of Canada and Canadians. Their warm feelings towards Canada do not preclude accidents that might occur while experimenting new kinds of weapons. These groups may also consider using biological weapons to assassinate stubborn leaders of refugee communities living in Canada or ambassadors of antagonistic states visiting Canada.⁸²

Canada is also home to an unknown number of religious or millenarian cults with Apocalyptic intent and mentally-ill individuals whose illness may manifest itself in threats or attempted acts of bioterrorism. The vast majority of all cults are completely non-violent. However, a few may infrequently follow a doctrine which may be interpreted as ordaining violence. While most of these cults would only use violence upon themselves in the manner of a mass suicide, for instance the Jonestown cult and Canada's Order of the Solar Temple, a few may turn their violence upon outsiders, for instance Japan's Aum Shinrikyo.⁸³ The typically closed and secretive nature of cults combined with the impossibility of predicting which groups will turn violent and which are harmless makes the task of ascertaining the threat posed by non-traditional religions rather difficult. Typically, outsiders only become aware that a seemingly peaceful cult is capable of violence when they actually carry out a mass suicide or murder. Mentally ill individuals who threaten to use biological agents, and who sometimes succeed in acquiring and cultivating biological agents, appear once in a while in all countries.⁸⁴

The United States is home to a similar variety of international terrorist groups as are represented in Canada. However, these groups may wish to harm their hosts. Hizballah and Hamas in particular are known to have representatives in the United States, and are known

to have staged numerous terrorist incidents against the United States.⁸⁵ The United States is also a potential target for international groups operating outside of North America, such as Osama bin Laden's network of 4000 to 5000 Islamic terrorists and militants, who currently operate out of Afghanistan.⁸⁶

The United States is home to a great number of violent right-wing extremists and militias. These groups often turn to violence to articulate their anti-government and racist philosophies. They have been known to bomb government buildings and newspaper offices, and manufacture ricin with the intent of assassinating a sheriff and a deputy U.S. marshal.⁸⁷ These groups tend to act in secret, so knowing exactly how many exist and what their plans are can be difficult.

Like Canada, the United States has a large number of extremist animal rights activists, anti-abortionists, and environmentalists. While Canada's environmental extremists have lately been quite a bit more active than American environmentalists, these terrorists still pose a significant threat to the United States. The Evan Mecham Eco-Terrorist International Conspiracy (EMETIC) damaged power poles and ski lifts in Arizona during the 1980's. Earth First! has sabotaged logging operations on the American west coast, and continues to threaten these operations.⁸⁸ American animal rights activists are much more destructive than their Canadian counterparts. The ALF burned down a veterinary clinic in California in 1987, and placed nine firebombs in Chicago department stores in 1993. American anti-abortionists are many times more dangerous than their Canadian counterparts. Besides murdering people, American pro-life extremists have released noxious gases in planned parenthood clinics, firebombed others, and threatened clinic employees. Like Canada, the United States has its share of religious and millenarian cults and mentally ill individuals, who appear occasionally in all open societies.

Even though both countries are threatened by a huge number of terrorist groups, it takes a special kind of terrorist to use biological weapons. To carry out each kind of

bioterrorist incident, a terrorist needs to overcome the technical and motivational barriers mentioned above. While some incidents have relatively few barriers of either kind, some, as was shown during the first section of this chapter, have so many that they are nearly impossible to achieve. Some kinds of terrorist groups are more capable of overcoming these barriers than others. By comparing which groups are capable of carrying out various bioterrorist incidents, to which groups presently threaten the United States and Canada, we may ascertain what type of incidents are most likely to occur in both countries.

Thankfully, very few terrorists are willing to take all of the risks associated with perpetrating a macroterrorist act. Of the groups present in both the United States and Canada, only large cults with some sort of Apocalyptic mandate would be able to overcome both the technical and moral obstacles associated with macroterrorism.⁸⁹

Groups that believe that their actions have been ordained by God will not fear death because they believe they will have a blessed afterlife in return for helping bring about the Apocalypse.⁹⁰ Therefore, they will not be deterred by the possibilities of brutal punishment or of being infected by their own microbes. Similarly, they may not fear infection if they are led to believe that their faith will somehow protect them from becoming infected. These groups may be willing to bring about the slow and agonizing deaths of thousands of people if they believe their victims to be evil sinners who deserve such a death, or that it is their undeniable duty to bring about the end of the world by killing as many people as possible. These groups will not be troubled by the possibility of losing popular support in their constituencies because they often have their own sources of wealth. Groups with an Apocalyptic vision will be willing to forego media attention, since their goal is to kill as many people as possible, not extortion or attracting attention. In fact, if their doctrine makes reference to plagues, Apocalyptic groups may be even more attracted to biological weapons.

Only the largest cults would be able to overcome the technical obstacles associated with macroterrorism. There is a correlation between the size of a terrorist group, and its ability to overcome technical obstacles. Generally, larger terrorist groups have greater financial resources. These resources may have been donated to the group by their members, or may have been raised by the members through fund-raising or criminal activities. A terrorist group with greater financial resources will be able to order more expensive cultures from mail order houses, purchase more advanced cultivation equipment, and hire scientists to work for them. The size of a terrorist group, then, is often a good indicator of its ability to overcome technical obstacles.

Some cults have huge memberships. The Rajneeshees had approximately 4,000 members, while the Aum had as many as 40,000.⁹¹ It is quite possible that there are cults operating within the United States and Canada who have even more members. Because their members are sometimes required to give over all of their worldly possessions, cults often have tremendous financial resources. This allows them to build compounds and high security headquarters, or develop biological weapons. Highly trained scientists are not immune from being brainwashed by cults either. A registered nurse was a highly influential member of the Rajneeshees, while the Aum possessed a number of scientists, including a PhD-trained microbiologist and a chemist.⁹²

International terrorist groups such as Hamas and Hizballah may not fear reprisal or death, due to their belief that participation in the *Jihad* will guarantee them a blessed afterlife. Nor would they be deterred by the possibility that they will be responsible for the deaths of large numbers of people if they believe that these infidels deserve to die. However, these groups do occasionally look to various Islamic communities for both moral and financial support. They may be deterred from bioterrorism by the possibility of losing this support. Even the independently wealthy Osama bin Laden may be deterred by the possibility of losing the favour of his Islamic supporters. For this reason, combined with the

possibility that some acts of bioterrorism may not be able to generate as much media attention as conventional bombings,⁹³ international terrorist groups will probably be unwilling to perpetrate any kind of bioterrorist act involving the actual use of disease-causing agents. However, these groups may still consider perpetrating bioterrorist hoaxes and possibly murders, agro-terrorism, and possibly some small scale attacks, if they can plausibly deny responsibility for these acts, and thus retain the support of their constituency.

International terrorist groups have many members, indicating they probably have access to a lot of funds. They have also participated in hugely destructive bombings, indicating they have at least some technical expertise. Although they may not be able to carry out a macroterrorist attack, they may be technically capable of product tampering, murder, hoaxes, and some varieties of small scale, non-lethal, or agro-terrorist attacks. Osama bin Laden's network is sufficiently large and well-funded to be capable of a similar range of attacks.

Mentally-ill individuals, such as schizophrenics and sociopaths who appear periodically in both Canada and the U.S., may be willing to take all of the risks associated with macroterrorism. This is largely a function of their distorted reasoning capabilities. If they do not understand the consequences of their actions, they may be willing to kill many people, and they may not fear being punished or infected. These individuals do not usually have outside moral or financial support, so they will not be deterred by the possibility of losing this support. Nor would they probably care about attracting public attention.⁹⁴

Although mentally ill individuals may be quite interested in a biological attack, they are extremely unlikely to have the skills and resources necessary to accomplish all but the simplest of biological attacks. Mental illness does not usually permit the constant effort and concentration necessary to acquire an advanced knowledge of microbiology.

"Schizophrenics, in particular, often have difficulty functioning in groups, and group effort

would be necessary for large-scale dissemination of ... biological ... agents."⁹⁵ The only acts within their grasp right now are hoaxes, the simplest acts of murder, and possibly product tampering, if they use an easy to acquire toxin like ricin.

However, this situation may soon change:

...the Internet may make it easier for individuals who dislike groups to communicate with others and to collect weapons-related information with minimal face-to-face contact.⁹⁶

The Internet gives the mentally ill quick and relatively private access to a broad selection of useful information. It also lets them to broadcast their views in a forum that allows them to put their best face forward, and solicit support from other like-minded and insane individuals. The world-wide threat of biological weapons produced and released by mentally ill individuals is increasing, thanks to the advent of the Internet.

Ultra right-wing groups and militias, as are present in great numbers in the United States, are willing to take fewer risks than Apocalyptic cults. While they may be willing to murder individuals whom they believe have treated their organization unfairly, or even kill entire ethnic groups so as to create a purified New World Order,⁹⁷ they may be unwilling to risk capture and brutal punishment or the possibility of infection. However, these secretive organizations do not care for media attention, and they are often independently wealthy, so they will not be troubled by the possibility of losing financial support from outsiders.

Because they may be unwilling to risk capture or infection, ultra right-wing organizations have fewer options open to them. To preclude the possibility of infection, they may decide to limit their activities to those that do not involve any actual microbes, such as hoaxes, or those that may be accomplished using less dangerous pathogens, such as non-lethal attacks or agro-terrorism. With the proper precautions, murder and product tampering may also present little possibility of infection. If they fear capture they will avoid

all extortive attacks, and limit their actions to those that will be mistaken for natural outbreaks of disease, such as covert product tamperings, murder, and agro-terrorism. Hoaxes, which are difficult to trace, are also a possibility.

Some ultra right-wing groups operating in the United States might have the membership and associated resources necessary to produce some simple biological weapons. Right wing groups have certainly shown interest in biological weapons on several occasions. In 1998, Larry Wayne Harris, a former Aryan Nations member with tentative plans to release biological weapons in the New York City subway system, was arrested after informing an acquaintance that he possessed military grade anthrax.⁹⁸ In 1993, Canada Customs officials seized 130 grams of ricin from an American with links to survivalist groups.⁹⁹ In 1996, gas mask and chemical protection suits were found in a weapons cache in British Columbia belonging to an American militia group.¹⁰⁰ These groups have also shown themselves to be capable of manufacturing massively destructive conventional weapons, such the truck bomb used to blow up the Murrah building in Oklahoma.¹⁰¹ All of the simpler biological terrorist acts, including murder, product tampering, and some small scale, non-lethal, and agro-terrorist attacks are all within the range of their technical abilities.

Single issue terrorists would be willing to take even fewer risks. While they may be willing to bring about the deaths of abortion doctors and employees of companies that harm the environment, they have no desire to produce many indiscriminate deaths, partially because they do not wish to be punished for killing a large number of people. This eliminates the options of small scale indiscriminate attacks and macroterrorism. Since the success of many of these groups' action hinges upon the media attention they receive, they may be less willing to carry out any actions that may attract little attention, such as non-lethal acts. These groups would also fear infection, and would therefore avoid acts that involve the use of more dangerous pathogens. Still, there is a slight chance that single issue

terrorists may use biological weapons to murder loggers, abortion clinic employees, or prominent executives whose companies test their products on animals. They may also tamper with products produced by a company that does not display adequate concern for the environment or animal rights. They may poison livestock or crops that encroach upon wild areas. Single issue terrorists have already falsely claimed to have carried out all of these actions.

However, these groups depend heavily on financial and moral support from more moderate pro-life supporters, animal welfare organizations, and environmentally-concerned people from across North America. Therefore, in order to avoid the stigma attached to biological weapons use they will likely avoid all acts that involve the actual use of biological weapons. Therefore, in all probability, single issue terrorists will limit their bioterrorist activities to hoaxes.¹⁰² These acts pose no danger of accidental infection, are difficult to trace, have less of a stigma attached to them, and create a fair amount of media attention, given the ease with which they may be carried out.

Even though few single issue terrorists are likely to overcome the motivational barriers necessary to produce biological weapons, they may be technically capable of perpetrating a few bioterrorist attacks. Some of these groups have large memberships and are supported by funds raised by the more legitimate arms of their operations. Their issues may also attract the support of biologists and doctors who are acquainted with the objectionable practices in the targeted industries. These groups have already perpetrated bioterrorist hoaxes on numerous occasions, such as mailing letters falsely claiming to be contaminated with anthrax or AIDS,¹⁰³ indicating they have at least considered this option. The firebombings and noxious gas releases that single issue terrorists are known to be responsible for indicate that they have at least some technical skills.¹⁰⁴ There is no reason why some of these groups would not be technically capable of further hoaxes, actual

instances of product tampering, murder, small scale releases, some non-lethal acts, and some simpler forms of agro-terrorism.

In summary then, since the United States is more threatened by international terrorist groups, such as the LTTE, Hamas, and Hizbollah, it is more likely to be the victim of the attacks that international terrorist groups would likely gravitate towards, namely murder and assassination, agro-terrorism, small scale attacks, and especially hoaxes. Likewise, because the United States is home to a greater number of right wing extremists, it is more at risk of hoaxes, murder, non-lethal terrorism, product tampering, and agro-terrorism. Because the United States and American businesses are threatened by greater number of animal rights and anti-abortion terrorists, the U.S. is more likely to be the victim of murder, product tampering, and hoaxes again. However, because Canada is more threatened by environmental terrorists, it is more likely to be the victim of the acts towards which environmental terrorists gravitate, namely agro-terrorism, murder, product tampering, and hoaxes. Both states are home to an unknown number of cults and lone, mentally ill terrorists. Therefore, both states are equally likely to be the victims of hoaxes, murders, and product tampering incidents as perpetrated by the mentally ill, and macroterrorist attacks, as would arise from Apocalyptic cults.

We would be quite remiss if we were to conclude our evaluation of the bioterrorist threat to Canada and the United States with a discussion of the multifaceted threat of bioterrorism and an analysis of the terrorist groups who are most likely to use biological weapons, for some attributes of the potential victim state may also affect the threat of bioterrorism. Many analysts are very aware that qualities possessed by the target state are capable of increasing the possibility that it will be the victim of a bioterrorist attack. In fact they are so aware of this fact that they base their entire arguments on clichés about the infinite vulnerability of open societies to all acts of terrorism.¹⁰⁵ However, a state can have

many other qualities besides openness that will also have a significant impact on both the likelihood and destructiveness of the various types of bioterrorist acts. This section will discuss some of these qualities, decide how these factors apply to the United States and Canada, and consider how this affects the threat posed by bioterrorism.

The Target State

Does the target state engage in activities that might be objectionable to terrorists?

There are an infinite number of operations that a state or its citizens could be involved with that terrorists might find unacceptable for whatever reasons, and to which these groups might respond with an act of bioterrorism. Internationally, a state could annoy nationalist or separatist terrorists by becoming involved in their homeland's conflicts. If a state makes an enemy of another state which is their military inferior, they might find themselves at increased risk of terrorist attack.¹⁰⁶ If the inferior state has no chance of winning a conventional war, or even of causing significant damage to the target state in such a war, it might encourage terrorist attacks upon the superior state in order to express its continued hostility.

The United States has a habit of making enemies of states that are its military inferiors, and this, many Americans fear, will make the U.S. the object of a bioterrorist attack. As American Defense Secretary William Cohen put it:

Our American military superiority presents a paradox ... because our potential adversaries know they can't win in a conventional challenge to U.S. forces, they're more likely to try unconventional or asymmetrical methods, such as biological or chemical weapons.¹⁰⁷

Iraq, Iran, Libya, North Korea, and Syria have all had less than cordial relations with the United States. The United States government charges that these same states have offensive

biological weapons programs, and might be tempted to bestow some of the fruits of their state-run programs to terrorists.¹⁰⁸

As the subject of such animosity, the United States is at an increased risk of several varieties of bioterrorist attack. If these inferior enemies see the president of the United States or any prominent generals as the source of their woes, they might decide to assassinate this individual, perhaps using a biological agent. If a state long subjected to a lack of food caused by U.S.-led sanctions wishes to return the favour, as it were, the United States might find itself the victim of crop or livestock bioterrorism.¹⁰⁹ Terrorists sponsored by one of these states might also execute a hoax or even a small scale act of bioterrorism, in order to convince the United States to change its policies towards that state, though these sorts of act probably would not be successful at effecting any kind of favourable change.

For its part, Canada has proven to be much more equanimical. Despite our repeated support of American-led sanctions, Canada has not become as much of an object of international antipathy as our larger ally. Perhaps as a result of our well-maintained moderate and peace-loving image, perhaps because we are not seen as "an imperial power trying to rule the world,"¹¹⁰ perhaps because we have fewer military inferiors, Canada has skilfully or luckily sidestepped the hazards involved with making enemies of states that might choose to sponsor terrorism if they are unable to win a conventional war.

Nevertheless, Canada may soon find itself the subject of some animosity for becoming involved with peacekeeping, or Gulf War-type international efforts.¹¹¹ Such good-intentioned efforts may not be appreciated by all the participants in such conflicts, including nationalist or separatist forces as well as state-led military forces. Any of these groups may decide to use biological terrorism to convince Canada that such involvement is too dangerous, and that they should leave the troubled location. They may choose to engage in small scale attacks either upon Canada's overseas forces or in prominent locations in

Canada itself. Hoaxes are also a distinct possibility, as is assassination, if one particular Canadian comes to embody the hated peacekeeping force.

Overall, the United States gets involved with at least as many international peacekeeping or police action operations as Canada, and is therefore just as likely to fall victim to attacks with this motivation as Canada. Nevertheless, the United States is at much greater risk of terrorist attack sponsored by enemy states.

Terrorists may object to other government actions too. If a state fails to condemn doctors who perform abortions for their actions, allows logging companies to destroy environmentally significant ecosystems, permits the sale of genetically modified foods, allows its businesses to operate in countries with poor human rights or environmental records, or oppresses a sector of the population, it may be subjected to some sort of terrorism meant to convince the state to change its policies. These acts would usually take the form of a hoax or small-scale attack, but agro-terrorism, product tampering, and extortive acts of non-lethal terrorism are also possible.

Both the United States and Canada have done things to anger terrorists claiming to represent the interests of aggrieved parties, and thus both are subject to terrorism motivated by these issues. It is quite impossible for a state to not offend some groups with the implementation of controversial policies. Nevertheless, as has been shown in the previous section, the domestic terrorists in the U.S. are much more virulent than those in Canada. Thus, even though both countries have implemented many policies that are objectionable to terrorists, the United States is at greater risk because of it.

Does the target state have business that engage in practices that might be objectionable to terrorists?

Just as states may be subjected to violence due to unpopular actions, businesses in states may become the victims of terrorism due to objectionable practices. Although terrorism is

normally thought of as directed against a state, acts of violence directed against a business may injure as many people and create as much damage as any act directed against 'the state' itself. Therefore, preventing acts of terrorism directed against businesses is just as desirable and worth discussing as preventing acts of terrorism directed against 'the state' or 'society.'

If a business damages the environment, operates in countries with poor human rights records, grows genetically modified foods,¹¹² contributes to the death or injury of animals, interacts with ethnic groups with whom terrorists have a grievance, or contributes to the advancement of globalization at the expense of large sectors of the population, some groups may decide to tamper with its products or commit agricultural terrorism in order to destroy the market for this business's products. If the business has a high profile leader, he or she may be assassinated by terrorists. Hoaxes, which are easier to perpetrate, may also be carried out in order to create financial hardships for the business.

The United States has a plethora of high profile businesses that offend sectors of the population that might turn to terrorism. Multinational corporations such as McDonald's and Coca-Cola contribute to globalization. Cosmetic and pharmaceutical companies based in the United States test their products on animals. Hundreds of family planning clinics in the United States conduct abortions, while logging companies, mining operations, and development corporations contribute to widespread environmental degradation.¹¹³

Canada has fewer businesses that are offensive to terrorists, but is far from immune to these sorts of attacks. Besides domestic logging companies, abortion clinics, and animal research laboratories, some of Canada's overseas business interests may soon annoy terrorist groups enough to be subjected to bioterrorism. Although Talisman in the Sudan has so far been unmolested, this may change very quickly. Terrorists may likewise choose to punish a Canadian mining company known to have contaminated a river in the Philippines for its actions. Canada's nuclear exporting industry may be subjected to terrorism for selling nuclear technology to Turkey and, until recently, Romania.¹¹⁴

Businesses operating in such restless countries as Nigeria and Guyana may also be subjected to bioterrorism. Although it would seem that American businesses are more likely to be the victims of a bioterrorist attack, simply by virtue of there being more of them, Canadian businesses are also somewhat at risk.

How closely connected is the target state to other states that are also threatened by bioterrorism?

A state's relationships with other states can increase the chances that it will be harmed by an act of bioterrorism. Specifically, a close relationship with a state that is threatened by bioterrorism can increase the threat of bioterrorism to its allies and neighbours. For instance, if a state shares a contiguous border with a threatened state and stable biological weapons are deployed outdoors and in an aerosol form in a city near the border, there is every chance that some of these microbes may drift into the other country and infect people there. If pathogens are released in crops or livestock near the border, they may likewise spread into the other country. Thus, sharing a border puts the neighbouring state at an increased risk of being harmed by macroterrorist and small scale attacks, both of which may involve open-air aerosol dissemination, as well as agro-terrorism.

Similarly, if two states are known to be close allies, but one has hardened its potential terrorist targets by implementing programs designed to prevent or minimize the damage done by bioterrorist attacks, a terrorist group antagonistic to both might use the unprepared state as a sort of proxy target and carry out an attack there.¹¹⁵ Or, if one state has not made enough of an effort to eliminate terrorist groups operating in its own territory, it could find that it has unwittingly become a host for terrorist groups who are using its territory as a safe haven while they plan an attack on another state.¹¹⁶ While this itself may not trouble the host state, the possibility that terrorists might have an accident while experimenting with pathogens should be a concern. The possibility that the target state

could decide to reduce the threat posed by terrorists residing in the unprepared host state by taking matters into its own hands should also be cause for concern on the part of the host.¹¹⁷

If the residents of two states closely resemble each other in speech, mannerisms, and appearance, it is possible that terrorists may confuse the residents of one state with residents of the other. Both during overseas and homeland attacks, citizens of one country may be mistakenly caught up in a terrorist attack meant for citizens of the other.¹¹⁸ This of course is only a concern when considering indiscriminate attacks, such as small-scale or macroterrorist attacks. Presumably, terrorists will not mistake residents of another country for an intended assassination victim, livestock, or crops.

Finally, the threat increases if the residents of both countries routinely visit the other country, in particular if they use air travel. If a person who has unknowingly been infected with a communicable disease, such as might happen during a covert macroterrorist attack, travels to another country, he or she could infect residents of this other country. The infected person could also infect every other passenger on the airplane, some of whom might be travelling even further abroad. The constant and increasing movement of people between countries puts all states at a greater risk of being harmed by bioterrorism. This is one of the most potent arguments for bioterrorism to be thought of and dealt with as a global problem and not just a national one.

Both Canada and the United States are threatened by their relationship with each other. The two countries share a long border, with many cities situated quite close to it, and residents of both countries frequently travel to the other state for a multitude of purposes. Because the United States has gone to great efforts to harden some its potential targets, Canada is at greater risk of a proxy attack. This has been a concern for Canada's nuclear power plants, none of which are as well-guarded as their American counterparts.¹¹⁹ Because Canada has become a safe haven where many international terrorist groups plan

attacks, procure weapons or materiel, recruit new members, and engage in fundraising, the United States is at an increased risk of terrorist attacks originating here. Since the December 1999 apprehension of Ahmed Ressam, the Americans are well aware of this source of vulnerability, as evinced by their proposal to "(Improve) monitoring on (their) northern border with secure communications equipment and advanced monitoring equipment, including high resolution day and night camera technology."¹²⁰ If Canada is unable to curb the actions of these terrorists, there is a chance that the United States may decide to eliminate this source of worry themselves. Overall, however, Canada is more threatened by its relationship with the United States than the United States is threatened by its relationship with Canada, but only because the bioterrorist threat to the United States is so much greater.

How has the target state responded to the threat of bioterrorism and/or previous terrorist acts?

Has the government acted to contain the threat quickly, and with little disturbance to the regular functioning of the state? Is the attention devoted by government and the media to the previous acts and the present threat even handed, with no attempts at fear-mongering? Were the perpetrators of the previous act caught and fairly punished? Or, did the residents panic in the face of the bioterrorist threat? Did the previous event receive lengthy news coverage, and does the threat of bioterrorism still receive extensive media coverage? Have politicians responded to this threat with a variety of harsh anti-terrorism laws and expensive counter-terrorism programs?

A state's attitude towards bioterrorism can have a tremendous impact on both the likelihood and impact of a bioterrorist attack. If a state's residents and politicians fear such an attack, the option of bioterrorism will be all the more tempting to terrorists whose success depends upon media attention and widespread fear.¹²¹ People who are frightened of bioterrorism are more likely to give in to the demands of anyone who threatens a

bioterrorist attack, while the panic that would inevitably follow a bioterrorist attack would create disruption on a grand scale. Hoaxes, product tampering, small scale attacks, and agro-terrorism will all be more disruptive and damaging in states that are frightened of bioterrorism.

The United States seems to have overreacted to the threat of bioterrorism. American media coverage given to the 1993 bombing of the World Trade Centre and the 1995 bombing of the Alfred P. Murrah building in Oklahoma was gratuitously extensive.¹²² It was and is followed by continued media appearances of politicians, novelists, and researchers, all of whom are eager to describe the bioterrorist threat as immediate, inescapable, and mortally dangerous.¹²³ New harsh laws were enacted following the 1995 bombing, including one guaranteeing the death penalty to anyone convicted of a terrorist bombing.¹²⁴ Domestic preparedness plans costing billions of dollars and involving over forty branches of government were created. New WMD response teams were created within the Marines and the National Guard.¹²⁵

Despite the United States' declaration that it will never make substantial changes to its policies in response to terrorist acts,¹²⁶ by these reactions it is clear that it has done just that. For although it might never knowingly concede to a terrorist group' demands, this overreaction to the threat of bioterrorism shows that the United States can be made to dramatically alter its policies in response to terrorism.¹²⁷ For those terrorists interested in creating disruption, nothing could be more gratifying than to have the United States respond in a similar dramatic fashion to their small scale attacks, product tamperings, and even hoaxes.

Canada has responded to the threat of bioterrorism in a much more even-handed manner, although to be fair Canada has not recently endured terrorist incidents of the same scale as those that have occurred this past decade in the United States. If Canada does have the misfortune to be the victim of terrifying terrorist attacks, our attitude towards

bioterrorism may change drastically. Except for the odd, infrequent newspaper article¹²⁸ or Discovery Channel show about Canada's Nuclear, Biological, Chemical Response Team (NBCRT), Canadian media coverage of the threat of bioterrorism is nonexistent. Canada's politicians rarely mention the threat, and no new laws or bills have been introduced to help combat the bioterrorist threat. There is not even a section in Canada's criminal code pertaining to bioterrorism. Any deaths produced by such an act would be tried just as murders.¹²⁹

As a result, Canadians are less worried about biological terrorism. Hoaxes, small scale attacks, and other disruptive or extortive attacks will therefore be less successful, and hence less attractive to terrorists. This is not to argue that ignoring the bioterrorist threat is the best way to make it go away, but there are better ways to combat this threat than fear-mongering and throwing money at it, as will be shown in the next chapter.

Is the state reliant on a single crop or species of livestock?

An act of crop or livestock bioterrorism could have an enormous effect on a state that is reliant upon a single crop, be it timber, coffee grown for export, beef cattle, wheat, or sheep raised for wool. This act might be so devastating as to cause long-lasting economic hardships or even a famine. Thus, states that are more reliant upon a single crop, or agriculture in general, are more vulnerable to agro-terrorism.¹³⁰

Neither Canada nor the United States is so reliant upon a single crop that a famine would likely follow a bioterrorist incident directed at any one variety of crop or livestock. (Although if several diseases that attack a variety of crops were released at once, such a thing might very well occur.) Nevertheless, Canada does rely more upon the income provided by agriculture and natural resources than the United States does. If either Canada's timber stands or wheat crops were to be the victims of a bioterrorist attack, a significant

portion of our economy would be devastated.¹³¹ Thus, Canada is more vulnerable to agro-terrorism than the United States.

Does the target state have effective programs to combat the bioterrorist threat?

Well-thought-out programs designed to either prevent a bioterrorist attack or minimize its impact can be quite effective at reducing the likelihood and impact of a bioterrorist attack. Although a discussion of Canada's and the United States' responses to the bioterrorist threat would certainly aid in our discussion, such a thing will not be included right here. The purpose of the entire second chapter is to evaluate both countries' responses.

How open is the target state?

It is often remarked that open societies, like Canada and the United States, are infinitely vulnerable to terrorist attack, that the state's lack of control over the actions of its people gives them the freedom to organize and implement terrorist attacks.¹³² This is quite true.

Closed states may be able to prevent terrorism by creating complex and exclusive licensing procedures in order to control the possession of laboratory equipment and pathogens that might be used in a bioterrorist act. By making cults illegal, a closed society could prevent many attacks motivated by aberrant religious doctrine. Strict anti-sedition laws may help a closed society to prevent terrorist groups from recruiting new members, and help prevent acts motivated by hatred.¹³³ Creating draconian punishments for anyone convicted of bioterrorism and openly advertising these punishments will deter some terrorists. Giving law enforcement agencies free license to monitor telephone traffic, search a suspected terrorist's home, and arrest the terrorist all without warrant would greatly reduce the threat.¹³⁴ By monitoring internet traffic, the government of a closed society may be able to intercept secret plans or inflammatory seditious literature and arrest the authors before their writings bring about their desired result. (However, looking for sedition on the internet

is like looking for hay in a haystack) These measures would indeed make all acts of bioterrorism less probable, including hoaxes if telephone traffic is to be monitored. The trouble is that few open societies would be willing to give up their often hard-won freedoms even for the obvious benefit of preventing bioterrorism.

Both Canada and the United States are very open. Both accept refugees from around the world. Over forty percent of both populations have access to the Internet, and both allow cults to practise their unusual faiths without harassment. Nevertheless, both countries are occasionally willing to suspend a few people's rights for the benefit of the whole.

For instance, by its involvement with the Australia Group, Canada has proven to be quite eager to limit the trade in dangerous chemical and biological materials,¹³⁵ while the United States is willing to use brutal punishments to deter terrorism.¹³⁶ The U.S. is less willing, however, to impinge upon the right to freedom of speech in order to prevent sedition.¹³⁷ These are rather minor differences, and it may be safe to conclude that both states are indeed quite open, and therefore are quite vulnerable to all kinds of terrorist acts.

To summarize then, the United States has more policies which may prove irksome to terrorists, and more businesses that may also anger terrorist groups. It has overreacted to the bioterrorist threat, and its openness makes it vulnerable to all bioterrorist acts. For its part Canada is also vulnerable to all sorts of attacks due to its openness, while its reliance on agriculture makes it more vulnerable to agro-terrorism. Canada's close relationship with the United States also increases the likelihood that Canada will be harmed by a bioterrorist attack, occurring either in the United States or in Canada. However, according to these criteria, almost all bioterrorist attacks, except agro-terrorism and perhaps macroterrorist attacks, are more likely to occur in the United States than Canada, and to do more damage there. However, Canada is more vulnerable to agro-terrorist attack. These findings are summarized in Appendix IV.

Conclusion

It now remains for us to distil these 52 pages of guess-work, extrapolations based on incomplete information, and supposition into a clear evaluation of the threat of bioterrorism to the United States and Canada:

The threat of biological terrorism appears quite different when we realize that there are many different kinds of bioterrorist acts, each with different motivations, technical obstacles, and motivational constraints. When we view the threat of bioterrorism in this manner, some types of attacks, such as murder and hoaxes, seem more likely to occur than we had previously assumed, while others, such as macroterrorism, seem almost impossible.

The overall threat of bioterrorism is greater to the United States than it is to Canada, both because the United States is more vulnerable and because there are more terrorist groups wishing to harm Americans. The United States has made enemies of states that might resort to asymmetrical warfare, and has more businesses that might prove vexing to terrorists. Americans are more frightened of bioterrorism than Canadians, and former Soviet scientists are more likely to sell secrets to terrorists contemplating an attack upon the United States than to those who might wish to harm Canada. The United States is threatened by international terrorist groups such as Hamas, Hizbollah, and Osama bin Laden; a particularly violent set of anti-abortion terrorists; numerous ultra-right wing groups; some animal rights and environmental terrorists; and the usual assortment of cults and mentally ill cranks that trouble all open societies.

Nevertheless, the threat to Canada is not nonexistent. Canada is just as open as the United States, it gets involved with as many peacekeeping missions, and it too has many businesses with which terrorists might take issue. Due to its greater reliance on timber and agriculture, Canada is more vulnerable to agricultural terrorism. Canada's close relationship with the United States increases its vulnerability drastically. Fewer terrorist organizations wish to harm Canada or Canadians. The only threat to Canada posed by international

groups is the possibility that they will have an accident while manufacturing biological weapons for an attack planned for the United States, or the chance that they may use biological weapons to kill prominent refugees or ambassadors. Canada's anti-abortion and animal rights terrorists are significantly less active than their American counterparts, but our environmental terrorists are more active. Like the United States, Canada has its fair share of mentally ill amateur terrorists and Apocalyptic cults that may turn to violence.

The technical and especially the motivational constraints involved with all acts of bioterrorism except hoaxes make all of them extremely unlikely to occur in either state. Technically, hoaxes are the easiest to carry out, followed by murder, then product tampering. Small scale acts, non-lethal attacks, and agro-terrorism all require about the same amount of technical expertise to execute. Technically, macroterrorism is beyond the skills of almost all subnational actors. Morally, the easiest bioterrorist act to perpetrate is again the hoax, followed by murder, non lethal attacks, agro-terrorism, product tampering, and small scale attacks. The most difficult bioterrorist act is again macroterrorism.

Of these acts, the ones that are most likely to occur in the United States, or anywhere for that matter, are hoaxes because they require no technical skill or suspension of morality. All of the terrorist groups present in the United States would be capable of perpetrating them, and, because the United States is quite frightened of bioterrorism, a bioterrorist hoax would be very disruptive. Murder is the next most likely biological act to occur in the United States. Murders require relatively little technical skill or ability to overcome motivational constraints. Many terrorist groups in the United States, including international groups, cults, and possibly some single issue terrorists, could conceivably find a reason to commit murder. Product tampering is also a possibility. It is technically simple to accomplish, and many single issue terrorists would consider it, but the possibility of killing many people indiscriminately would deter a large number of them. Agro-terrorism, small scale attacks, and non-lethal attacks are less likely to occur. Macroterrorism is next to

impossible. Although many religiously-motivated terrorist groups within the United States would like to bring about a macroterrorist event, the technical obstacles involved with macroterrorism are nearly insurmountable.

The most likely event to occur in Canada is also the bioterrorist hoax. However, due to Canadians' present lack of interest in biological weapons and the relative absence of terrorists interested in harming Canada, hoaxes are much less likely to occur here than in the U.S. Murder and assassination are the next most likely events, again because Canada's allotment of international terrorists, single issue terrorists, cults, and the mentally ill are all probably capable of overcoming the technical obstacles involved with this event, while fewer are capable of overcoming the motivational constraints. The threat of agro-terrorism is greater to Canada than it is to the United States, both due to Canada's greater reliance on revenues generated by timber and agriculture, and because Canada is more threatened by environmental terrorists, who are more inclined to consider agro-terrorism than other terrorists. Except for macroterrorism, which is again next to impossible, the remaining acts are all about equal in probability.

Notes to Chapter One

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Chapter Two - Responses to the Bioterrorist Threat

Now that we have determined the relative likelihood of a bioterrorist act occurring in the United States and Canada, and decided which varieties of events are most likely to occur in each country, we must examine both states' responses to this threat in order to determine whether these responses are well-suited to combating the sort of threat present in both countries. This chapter will discuss the major thrusts of Canada's and the United States' counter-bioterrorism strategies, and attempt to determine whether either set of responses is suited to reducing the threat of bioterrorism. While this chapter will offer criticism of apparent weaknesses of both counter-bioterrorism strategies, suggestions for improvement will for the most part be reserved until the next chapter.

A General Strategy To Follow

In general terms, what is the best strategy for all states to follow to minimize the bioterrorist threat? There are an infinite number of possible solutions to this troublesome problem, but what strategy is the best for all states to follow? It is possible to focus one's attentions on the most dangerous and potentially damaging form of bioterrorism, namely macroterrorism.¹ Although this type of bioterrorism is the least likely to occur anywhere, the argument goes that the possible consequences of such an event are so great that it would be quite imprudent to ignore this type. However, if we extend this argument to its logical conclusion and recommend preparing for events that are potentially catastrophic but are extremely unlikely to occur, we will end up wasting resources preparing for events as improbable as meteorite impacts and alien invasions. Certainly, these events may be quite destructive, but "there might be better uses for scarce defense dollars."² To prepare for only the most destructive forms of bioterrorism, while ignoring the more probable if less damaging types of attacks would be quite negligent, to say the least.

It is possible to prepare for the most likely events, these being hoaxes and murder in the United States; and hoaxes, murder, and agro-terrorism in Canada, while ignoring the potentially catastrophic but extremely unlikely varieties. This strategy would certainly eliminate the wasted spending on events that never actually occur, but it leaves us conspicuously vulnerable to the most destructive forms of terrorism, the possibility of which provided much of the impetus for most counter-bioterrorism plans. If we extend the argument in favour of preparing only for the most likely events to its logical conclusion, we end up not preparing for bioterrorist events at all. Terrorist acts using conventional weapons such as guns and bombs are still more likely to occur than all forms of bioterrorist attacks. If we prepared for only the most probable events, we would direct our funds entirely to reduction of the conventional threat, and ignore bioterrorism completely. Surely, this is as negligent as preparing for only macroterrorism.

The third possible strategy falls somewhere between preparing for only the most likely events and preparing for only the most damaging. It is to prepare for both the more likely and the more destructive bioterrorist events. It is quite feasible to create a mechanism of preparedness programs that are capable of effectively reducing the threat posed by all forms of bioterrorism from hoaxes to macroterrorism and all varieties in between. Reducing the threat posed by more types of bioterrorism is certainly safer than focussing on just the more likely attacks while ignoring the more destructive acts, or vice versa. Of course no one policy should be expected to be able to combat all forms of bioterrorism by itself, but a well-thought out system of programs and policies working together should be able to reduce the bioterrorist threat *in toto*.

For example, an ideal response to the bioterrorist threat might include such elements as international treaties restricting the transfer of deadly human pathogens, plant and animal pathogens, and even non-lethal agents, which would reduce the threat of bioterrorism arising from international sources. Domestic laws and intrusive licensing procedures for

laboratories possessing any amounts of pathogens would greatly reduce the domestic threat. An education program informing the public of the minimal danger posed by bioterrorism would reduce the effectiveness of hoaxes and extortive acts of bioterrorism. Medical response teams and rapid response teams could help mitigate the consequences of small scale attacks, product tampering, non-lethal terrorism, and macroterrorism. Pharmaceutical stockpiles containing general purpose vaccine producing materials would help curb the spread of contagious diseases, as might be released in a macroterrorist attack, and, if the prophylaxis is administered in a timely fashion, reduce the damage done in non-lethal incidents, small scale attacks, product tampering incidents, and even murders. Training first responders, such as firefighters and the police, to better respond to bioterrorist attacks would mitigate the consequences of extortive acts of bioterrorism, while training medical personnel to recognize the victims of a bioterrorist attack would help in the response to covert bioterrorist attacks. Integrating the agencies responsible for monitoring plant and animal health into a state's preparedness plans would reduce the threat of agricultural terrorism. Other programs not listed here could also help to reduce the threat posed by many types of bioterrorism. In an ideal response to the bioterrorist threat, elements such as these work together to reduce the threat posed by all forms of bioterrorism.

The argument in favour of an all-encompassing approach to the threat of bioterrorism is strengthened by the fact that terrorists have a tendency to be irrational. Recall from the introduction that terrorism is a remarkably ineffective means to most ends. Have anthrax hoaxes mailed to planned parenthood clinics reduced the number of abortions performed? Have car bombs improved the lot of Palestine, or convinced the British to leave Northern Ireland? If terrorists had based their decision to use terrorism on a rational weighing of costs and benefits, there would be no terrorism. Since terrorism does exist, we must conclude that terrorists based their decision to use terrorism on an irrational weighing of costs and benefits. If terrorists have all made one irrational decision, namely the decision

to use terrorism, there is a good chance that some of their succeeding decisions will also be irrational, especially since most of these decisions will be made with less deliberation than the weighty initial decision to use terrorism. These succeeding irrational decisions may be as insignificant as what to wear on the day of the attack, or they may be as significant as which type of biological agent, ricin or smallpox, should be used in a small scale attack. Terrorists may actually end up perpetrating types of bioterrorist incidents that do not seem to be in their best interests. Because we base our predictions on what is in a terrorist group's best interests, we have little chance of correctly predicting these irrational acts. In the face of this unpredictability and uncertainty, it is decidedly safer to defend against all varieties of bioterrorism, and not just those that seem to be in the best interests of terrorists. "As there can be no certainty that terrorists will necessarily follow a rational approach ... Any strategy to counter (bio)terrorism must be broad band."³

A significant argument against such 'broad band' approaches is that they will necessarily cost a lot of money. This is a legitimate concern, but if these policies are well thought out an all-encompassing approach does not have to be an expensive one. As will be shown in the next chapter, it is quite possible to reduce the threat posed by all varieties of bioterrorism for a minimal output of 'scarce defense dollars.'

Which general strategies have the United States and Canada followed? Have they made the considerable mistake of focussing on the most destructive while neglecting to prepare for the more likely? Or, have they made the equally grievous error of preparing for the most likely events, while leaving themselves vulnerable to the most destructive? Has either developed an approach that reduces the threat posed by all forms of bioterrorism?

The United States' Counter-Bioterrorism Strategy

Since the mid-1990's, biological terrorism has been a major concern of the government of the United States. American policy makers observed the 1993 bombing of

the World Trade Center in New York, the 1995 bombing of the Murrah federal building in Oklahoma City, and Aum Shinrikyo's 1995 sarin attack on the Tokyo subway system and were convinced that the next target for a terrorist attack using weapons of mass destruction would be the United States.⁴ The United States has responded to this emerging threat with a number of initiatives embodied in several Presidential Decision Directives, new laws, international efforts, and preparedness programs. Although dozens of individual programs have been developed to combat this threat, the United States' response to the bioterrorist threat has three major thrusts. These are programs that take place in international fora, domestic programs meant to prevent bioterrorism, and domestic programs meant to mitigate the consequences of a bioterrorist attack. A table comparing the major programs associated with Canada's and the United States' response strategies may be found in Appendix V.

International Efforts

The international arm of the American response to the bioterrorist threat is composed of three major types of programs. These programs are efforts to reduce the threat in the G-7 (8), the Australia Group and other international organizations; collaborative research projects in Russia; and unilateral sanctions and export controls imposed on countries suspected of sponsoring terrorism. This section will discuss these three types of programs, and highlight the pitfalls associated with each.

Rightly or not, the United States has perceived the threat of biological terrorism arising from international sources to be quite substantial.⁵ In response to this perceived threat, the United States has become a driving force behind many of the efforts in international organizations intended to reduce the threat of biological weapons and terrorism. At the 1995 G-7 meeting in Ottawa, the United States helped create a declaration enjoining member states to "work together with the international community to combat terrorism in all its forms."⁶ The Ottawa Ministerial Declaration on Countering Terrorism

called upon G-7 states to, among other things, strive to join existing international treaties by the year 2000, inhibit the movement of terrorists, increase counter-terrorism training and assistance, and pursue measures to prevent the terrorist use of nuclear, chemical, and biological materials.

Following pressure from the United States, the 1996 G-7 meetings at Lyon and Paris also resulted in declarations endorsing international cooperation against international terrorism. The ministerial meeting in Paris also agreed to consider criminalizing the possession of biological weapons. Terrorism was a less salient issue at the 1997 G-7 summit in Denver. That meeting resulted in the rather uninspired conclusion that "Terrorism remains a threat to civil society."⁷

America's worries about WMD terrorism have prompted it to bring the issue of terrorism to the attention of the United Nations (UN). The efforts of the United States and its G-7 partners led to the creation of an *ad hoc* committee of the General Assembly, whose purpose was to create a Convention for the Suppression of Terrorist Bombings, and a Convention on the Suppression of Acts of Nuclear Terrorism. Although the Nuclear Terrorism Convention has not yet been finalized, in 1998, the United States was an enthusiastic signatory to the Convention Suppressing Terrorist Bombings, and in 1999 it signed the UN Convention for the Suppression of the Financing of Terrorism.⁸

Besides using the United Nations to help suppress international terrorism, the United States has used this organization to assist in its attempts to control the development of and trade in biological weapons. If international stockpiles of biological weapons are eliminated, the possibility that biological terrorists will be able to benefit from a state sponsor or steal weapons from a poorly guarded national stockpile would be substantially reduced.

In his 1998 State of the Union Address, President Clinton announced that the United States would attempt to strengthen the 1972 Biological and Toxin Weapons

Convention (BTWC) by pushing for the adoption of a mandatory compliance regime.⁹ The parties to this agreement, which entered into force in 1975, agreed "never in any circumstances to develop, produce, stockpile or otherwise acquire or retain biological weapons."¹⁰

In 1996, during the BTWC's Fourth Review Conference, six countries including the United States asserted the need for biological terrorism to be mentioned in the BTWC. The final declaration of the Fourth Review Conference accordingly read "The States Parties (to the Convention) recognize the need to ensure, through the review and/or adoption of national measures, the effective fulfilment of their obligations under the Convention in order, *inter alia*, to exclude the use of biological and toxin weapons in terrorist or criminal activity."¹¹

When it was first developed the BTWC had no legally binding inspection regime, meaning that even if other signatories strongly suspected a member state of violating the treaty, nothing in the treaty forced the suspect state to submit to international inspections commissioned to determine the validity of the accusations. This has allowed the Soviet Union and Iraq, and probably several other states, to develop biological weapons programs without fear of reprisal, even though they are signatories to this Convention.

This shortcoming of the BTWC has long been acknowledged. Since the BTWC's second review conference in 1986, state parties have lamented the lack of a verification regime.¹² Numerous Confidence Building Measures (CBMs) have been implemented, including a non-mandatory recommendation for state parties to exchange information with each other about biological research programs, past biological weapons programs, vaccination initiatives, and disease outbreaks taking place within their borders. Supposedly these measures enhance transparency, but "participation in the confidence-building measures ... has not been universal, and ... not all responses have been prompt or complete."¹³

During the Third Review Conference of the BTWC in 1991, following numerous reports that Iraq had violated the convention with impunity, the United States asserted that the BTWC, as it stood then, was unverifiable. An *Ad Hoc* Group of Government Experts to Identify and Examine Verification Measures from a Scientific and Technical Standpoint was established to examine the possibility of creating a verification regime. This group, known as VEREX, has been chaired by Ambassador Tibor Toth of Hungary.¹⁴

Although VEREX has had twenty-one four-week long sessions since 1994, it has so far been unable to come up with a verification regime suitable to all participants. In 1996, the United States indicated that it would like to have the negotiations relating to the verification regime concluded by 1998.¹⁵ The G-7 has implied that it would like to have a feasible verification regime ready for discussion by November or December of 2001 when the Fifth Review Conference is set to take place. Ambassador Toth has been guardedly optimistic about meeting this deadline.¹⁶ Important issues regarding what combination of clarification visits, random routine visits, and challenge visits should be included in the verification regime still have to be resolved. Mandatory export controls, access to sensitive facilities, the period of time between approval of an investigation and the arrival of inspectors are all troublesome issues that require consensual solutions before the verification regime may be added to the BTWC.¹⁷

Although the United States has pushed hard for the verification regime to be implemented post haste, it has somewhat shot itself in the foot. Even though President Clinton announced support for a mandatory inspection regime, the United States has delayed completion of these proceedings by expressing concern that such inspections could compromise the security of private American research firms that have developed genetically manipulated bacteria capable of producing drugs.¹⁸ This is yet another thorny issue to be resolved before a mandatory compliance regime may be included in the BTWC.

Although both the United States and VEREX have presented a legally binding verification regime as the answer to the BTWC's ineffectiveness, it is not at all certain that such a regime would be able to eliminate world-wide stocks of biological weapons. Inspection visits are not always capable of locating biological weapons stockpiles or production facilities. For example, take the experiences of the United Nations Special Commission in Iraq (UNSCOM). UNSCOM was directed to work with the International Atomic Energy Agency (IAEA) to eliminate Iraq's weapons of mass destruction and establish a monitoring system to ensure that Iraq's weapons programs were not rebuilt. UNSCOM's inspectors

were to have the right to go anywhere at any time, to seize any document or record, and to photograph anything they wanted. Iraq has, however, stymied UNSCOM's attempts to confirm that its weapons of mass destruction have been eliminated UNSCOM was unable to conclude ... that all of (Iraq's chemical and biological) weapons have been destroyed.¹⁹

If an inspection team supposedly given free rein to visit all of Iraq's installations was not satisfied that it had found all of Iraq's biological weapons installations, what chance would a team that is only permitted to visit a few pre-chosen, highly suspicious sites, and is constrained by the suspect state's private businesses' intellectual property rights, have of finding all of a state's biological weapon stocks? It may be argued that the UNSCOM inspection teams were not able to satisfactorily complete their investigations due to widespread obstruction, harassment, and outright deception on the part of Iraqi government officials, but there is no reason to think that other rogue states with biological weapons programs would be any more willing to cooperate with UN inspectors investigating possible violations of the BTWC.

The United States is also a member of the Australia Group. The Australia Group was formed in 1984 in response to reports that Iraq had used chemical weapons in its war

against Iran.²⁰ It is an informal collection of about 20 like-minded industrialized states, mostly from Europe, who developed a system of harmonized export controls meant to reduce the possibility that terrorist groups and rogue states who are unable to import chemical weapon precursor materials from an individual levyer of export controls will simply import them from another state.²¹ Since 1992, the Australia Group has also attempted to control the export of materials that may be used to produce biological weapons.²² The Australia Group has a huge list of substances that participating states refuse to export. This list contains 54 chemicals that may be used to produce chemical weapons, nine varieties of manufacturing facilities and equipment that may also be used to produce chemical weapons, toxic gas monitoring systems and related technology, Levels 3 and 4 containment facilities, fermenters, centrifugal separators, cross-flow filtration equipment, chambers designed to test aerosols, 20 deadly viruses, four rickettsial agents, 13 bacterial agents, all varieties of pathogenic genetically-engineered organisms, 11 varieties of biological toxins, 15 species of animal viruses and one animal bacteria, six fungi that may infect plants, and two bacteria that might do the same.

The Australia Group also has a list of 25 warning agents, the export of which is not controlled, but should be monitored. If any foreign laboratory requests a controlled substance from a laboratory in a state participating in the Australia group, that state will alert the Group to the action in order to draw attention to what may be a burgeoning biological weapons program.²³

To reduce the overstated threat of un- or under-employed former Soviet biological weapon scientists selling their services to terrorist groups, the United States has funded a number of collaborative alternative research programs in Russia. In 1995, the U.S. Department of Defense (DOD) asked the National Academy of Sciences' (NAS) Committee on International Security and Arms Control to design a blueprint outlining the best way for the United States to cooperate with Russia to reduce the threat posed by biological

weapons. In 1997, the NAS issued its report to DOD. The plan described how collaborative research projects in the fields of epidemiology, disease prevention, diagnosis, and disease treatment taking place at former Soviet Union civilian biological weapons research institutes would both allow underpaid former biological weapons scientists to use their skills for purposes that are more beneficial to mankind, and give them enough money that they are not tempted by lucrative offers from rogue governments and terrorists organizations. The National Aeronautics and Space Administration (NASA), the U.S. Department of Energy (DOE), the CDC, the National Institutes of Health (NIH), the U.S. Department of Agriculture (USDA), and the NAS have all sponsored programs in Russia that employ former biological weapons scientists.²⁴

The Nunn-Lugar Cooperative Threat Reduction Program was created to do much the same thing. This program funded research programs in Russia through the International Science and Technology Center, the Civilian Research and Development Foundation, the Science and Technology Center in Ukraine, and the Initiatives for Proliferation Prevention program.

The success of these projects is said to depend "on the adequacy of funding."²⁵ Between 1994 and 1999, these collaborative programs have received an average of just \$3.56 million dollars per year. This is apparently not enough to keep the former weapons scientists above the poverty line. To correct this problem President Clinton proposed spending \$220 million between 2000 and 2004 to expand these programs.

These funding arrangements are in no way intended to be permanent.

Officials from the Initiatives for Proliferation Prevention program said they are developing an exit strategy that plans to stop funding new projects by fiscal year 2005 and to successfully commercialize their (the Russian research institutes') ongoing projects.²⁶

Besides the fact that the argument in favour of these collaborative programs rests on the largely fallacious assumption that there are a large number of underpaid Russian scientists who will sell their services and products to terrorists and rogue governments, there are other reasons that these programs deserve criticism. For instance, although the collaborative programs have successfully been implemented in a number of civilian installations, Russia's Ministry of Defense still refuses to allow collaborative projects in the facilities still operated by the Ministry. This has led to suspicions that Russia has continued its research into biological weapons, albeit in a much reduced form.²⁷ There are further concerns that some of the money given to collaborative programs by the United States may actually be used to finance these illicit biological weapons programs. The United States has implemented a number of safeguards to diminish this possibility, such as directly depositing the scientists' earnings into their bank accounts so that it cannot be redirected to other uses, and assigning American scientists to work with the Russian researchers and monitor their activities.²⁸ However, the possibility that these funds may be used to finance continued offensive biological weapons research remains.

The United States' international initiatives are rounded out by a series of sanctions and self-imposed export controls, which were implemented to prevent terrorists operating abroad and unfriendly states from easily acquiring the materials and cultures needed to produce biological weapons. Several laws enacted since the 1970's form an elaborate system of export controls. The Export Administration Act of 1979 prohibits the export of materials and technology that might be used to produce biological weapons to a list of proscribed countries. This list presently includes Cuba, Syria, North Korea, Iran, Iraq, Sudan, and Libya. These countries are singled out because they are thought to be state sponsors of terrorism even though, as the U.S. State Department admits, there is little or no evidence that Syria, North Korea, Cuba, Iraq, or Sudan continue to provide assistance to terrorists.²⁹ The Chemical and Biological Weapons Act of 1991 and the Anti-terrorism and

Effective Death Penalty Act of 1996 also include prohibitions on the export of precursor materials to these states.³⁰

It is doubtful that these export controls will have any great effect on the ability of international terrorists or state sponsors of terrorism to obtain samples of pathogens or equipment needed to produce biological weapons. Even though Iraq did indeed obtain its samples of anthrax bacteria from an American company under the false pretence that it would be used for peaceful biomedical purposes (Anthrax is endemic to the region.), the United States is not the only source in the world for viral and bacterial cultures. Besides natural sources, terrorists and unfriendly governments may obtain cultures from literally hundreds of culture collections world-wide, many located in states without export controls. Even if residents of these few proscribed states are unable to obtain materials directly from a culture collection in the United States, they may obtain them from laboratories in dozens of other countries.³¹

In 1995, Executive Orders Nos. 12957 and 12959 were signed, prohibiting American transactions with Iran with the purpose of developing its petroleum resources, and preventing the import of Iranian goods, services, and publications. The United States rationalized the decision to impose sanctions by asserting that Iran represented a threat to the national security, foreign policy, and economy of the United States due to, among other things, its support for international terrorism and its efforts to acquire weapons of mass destruction.³² In 1997, these sanctions were recertified.

The Iran-Libya Sanctions Act was enacted in 1996 in order "to deny Iran and Libya revenues that could be used to finance international terrorism. It was hoped that this legislation would force Libya to ... extradite the accused perpetrators of the Pan Am 103 bombing."³³ This act also established sanctions against foreign companies that invested over \$40 million dollars in either country in order to dissuade businesses from all countries from investing in either Libya or Iran.

Sanctions on Cuba were renewed in 1996. Congress justified the Cuban Liberty and Solidarity Act of 1996 by declaring that "the Castro government threatens international peace and security by engaging in acts of armed subversion and terrorism such as the training and supplying of groups dedicated to international violence,"³⁴ even though there was no evidence that the Castro government did support terrorism. Protests from Canada, the European Union (EU), and the World Trade Organization (WTO) temporarily delayed the implementation of this act.

In 1997, the United States declared a need for sanctions against Sudan in retribution for providing safe houses and facilities for several terrorist groups. These sanctions would also apply to foreign companies, such as Canada's Talisman Energy and the International Petroleum Corporation.³⁵ However, American oil companies working in Sudan would likely be exempt from the trade restrictions.

Sanctions of this type are incapable of effecting challenges that would stem international terrorism. Not only are few of these proscribed states actual sponsors of terrorism, but, in many cases, sanctions of some variety had been imposed on these states long before terrorism was used as a justification for this treatment. For example, the United States' trade relationship with Iran has been virtually nonexistent since the fall of the Shah in 1979.³⁶ The same sanctions under a different name and justification are unlikely to have the dramatic impact desired by their creators. In fact, sanctions imposed under false accusations of state sponsorship are more likely to polarize opinion against the United States, and prompt the rogue governments to continue their defiance.

Overall, the United States' international efforts to reduce the bioterrorist threat seem to indicate that the United States continues to believe that international sources are responsible for a good portion of the bioterrorist threat, regardless of the fact that the problems of state sponsorship and Russian scientists selling their services to terrorists are very much overstated. Nevertheless, this in no way means that all of these efforts should be

discontinued. Remember that no one set of policies should be expected to eliminate all sources of the bioterrorist threat. The United States is more threatened by international terrorism than Canada and, even if they have no other redeeming qualities, these actions show to the world that the United States and its cosignatories to the above conventions will not tolerate international terrorism. Furthermore, with the exception of the collaborative research projects, these efforts have been relatively inexpensive as far as counter-bioterrorism programs go. Participating in the G-7, the Australia Group, and the United Nations is not costly, especially if one does not pay one's fees or if one makes cuts to one's UN peacekeeping budget in order to finance other counter-bioterrorism projects.³⁷ Trade with Cuba, Iran, and the other proscribed countries has been virtually nonexistent for decades. A continuance of sanctions will not harm American business, especially if rich American oil companies are exempted from sanctions. Despite their multiple shortcomings, America's international efforts have some effect on the threat of bioterrorism arising from international sources. This combined with their inexpensive nature makes such efforts a tolerable if imperfect component of an integrated strategy to reduce the threat of bioterrorism.

Domestic Preventative Efforts

A well-crafted set of preventative programs would eliminate the need for extensive consequent management measures. Preventing an act of bioterrorism not only saves money that would otherwise be spent on expensive consequence mitigation programs, it saves lives. The Anti-terrorism and Effective Death Penalty Act was introduced in 1996, exactly one year after the Oklahoma City bombing.³⁸ Under this act, preventive programs have been introduced that, among other things, make the use of biological weapons a federal offence, implement more extensive domestic controls over the transfer of dangerous

pathogens, allocate more funds to the federal agencies responsible for prevention, and strengthen immigration laws to allow for the expedient deportation of 'alien terrorists.'³⁹

The Anti-terrorism Act directed the CDC to create a regulatory framework that both identifies biological agents that pose a significant threat to human health, and controls the transfer and use of these agents. The CDC published its list in 1997. The list included 30 biological agents, including viral hemorrhagic fevers, smallpox, bacteria such as anthrax, rickettsial organisms, fungi, and toxins such as botulinum, but no non-lethal agents, and no animal or plant pathogens.⁴⁰ This act requires all individuals and organizations in possession of any of these agents to be registered with the federal government. Approximately 200 medical and research laboratories in the United States are registered under this law.⁴¹

The Anti-terrorism Act also imposes severe penalties for the possession, manufacture, and use of biological weapons, building upon the prohibitions created by the Biological Weapons Anti-Terrorism Act of 1989.⁴² Under the Anti-terrorism Act, suspected bioterrorists are now tried in a federal court, and may receive the death penalty if convicted.

The effectiveness of this act is hampered by the fact that, in order to gain a conviction, the prosecutors must prove that the suspected terrorist's work with prohibited materials has no legitimate purpose. Otherwise, as was the case with Larry Wayne Harris, he or she must be released.⁴³

Under the Anti-terrorism Act, transfers of vaccines strains and toxins to be used for medical purposes, such as BoTox injections, are still permitted, as is research for peaceful purposes. Vaccine research bears a close resemblance to offensive biological weapons research. Both use the same materials and may involve growing large amount of a specific agent. Some vaccine research might even involve the use of extremely virulent strains of bacteria and viruses of the sort ideally used in biological weapons. What better way to test a

vaccine than to see if it prevents test subjects from contracting the most deadly strains known to medical science? It would not be difficult for biological terrorists to gain their release by claiming that their samples of dangerous pathogens were used to conduct legitimate vaccine research. However, in this law's defence, if an acquitted bioterrorist is released without punishment, federal agencies would probably continue to monitor his or her activities for a very long time. This could complicate further attempts to acquire and cultivate biological weapons.

The Anti-terrorism Act also allocated approximately \$1 billion to the fight against terrorism. The FBI received \$468 million of this grant.⁴⁴ The FBI and Department of Justice (DOJ) have received numerous other grants to help finance their efforts to prevent biological terrorism, in accordance with their roles as the lead agencies in charge of crisis management in the event of a terrorist attack as dictated by Presidential Decision Directive (PDD) 39. PDD 39, issued in 1995, designated roles for several government departments and agencies to play in the event of a terrorist attack. PDD 39 declared that the FBI would be in charge of anticipating and hopefully preventing such an occurrence, dealing with the immediate aftermath of such an attack, and pursuing criminal investigations relating to the attack.⁴⁵

In 1995, the FBI received only \$256 million to pay for its counterterrorism efforts. In 1999 it received over \$600 million.⁴⁶ While the majority of this money was spent on augmenting the FBI's intelligence gathering capabilities, the FBI has spent some of these funds on developing a number of new programs intended to help prevent biological terrorism. The FBI has appointed a special agent to each of its 56 field offices, whose purpose is to coordinate WMD-terrorism related intelligence gathering operations, undertaken both by the FBI and local law enforcement agencies, and to help orchestrate the use of federal assets during a biological or chemical incident. The FBI has also begun to train its agents to have a basic understanding of hazardous materials (HAZMAT)

operations. The goal is to have at least ten HAZMAT-trained agents in each of the larger field offices, and four in each of the smaller offices.⁴⁷

The FBI has also created a Weapons of Mass Destruction Operations Unit⁴⁸ at FBI Headquarters. This unit evaluates emerging threats directed to it by the field offices, local law enforcement agencies, or the national chemical and biological hotline. After evaluating the threat's credibility, the unit then dispatches a multidisciplinary team to the site to further assess the threat and help coordinate the federal response to it.

The FBI has created a number of teams that have a specialized role to play during a bioterrorist crisis. Some teams are specially trained in responding to unconventional terrorist threats, others in bomb detection, hostage rescue, evidence collection, negotiation, or responding to threats involving hazardous materials. The Hazardous Materials Response Unit's (HMRU) specialty is handling criminal investigations of WMD crime scenes. Their sole duty is to gather and safely transport forensic evidence that supports criminal prosecution of the accused. This unit is based at Quantico, Virginia and is comprised of two dozen people with field experience as fire-fighters, HAZMAT technicians, and paramedics. A team of eight to ten of these agents may be deployed to the site of a biological crisis anywhere in the United States within four hours. Between 1996 and 2000, this unit has responded to 36 incidents involving biological substances.⁴⁹

As important as a well-crafted regime of preventative measures could be, the preventative measures so far implemented in the United States are not terribly well-designed. The Anti-terrorism Act depends entirely too much on the difficult task of establishing intent, which may render it ineffective at catching and punishing biological terrorists. The CDC's list of controlled agents ignores plant and animal pathogens, and thus would be incapable of preventing agricultural terrorism. Although on its own the HMRU seems to be a good idea, there are numerous other federal groups with similar roles, as we will soon see. There are other preventative measures that have so far not been implemented

in the United States. Their introduction, as will be shown in the next chapter, would also decrease the likelihood of a bioterrorism attack significantly, and render extensive consequence management programs unnecessary.

Domestic Consequence Mitigation Efforts

The United States has resigned itself to the fact that a biological terrorist attack on American soil is inevitable. Government and scholarly sources agree that such an occurrence is no longer a question of 'if,' but 'when.'⁵⁰ Consequently, the United States has focussed its counter-bioterrorism plans on managing the consequences of such an attack.

The United States is keenly aware that detecting and preventing a bioterrorist attack before it occurs is a very difficult task, again because biological weapons may be produced clandestinely and because terrorists are a secretive lot whose activities are difficult to monitor. No matter how well paid the FBI is, as long as the United States remains an open society they cannot be sure that they will be able to apprehend all bioterrorists in time to prevent a bioterrorist attack. Prudence demands, therefore, that at least some funds are spent on mitigating the possible consequences of a bioterrorist attack.

The American consequence management strategy has eight main thrusts, including training for first responders, interagency exercises to test policies and skills learned, civilian and military rapid response teams, medical response teams, grants given to local authorities for the procurement of counter-bioterrorism equipment, medical stockpiles, research and development (R&D) initiatives, and the introduction of agencies with responsibility for the coordination of federal assets. Two Presidential Decision Directives and one bill introduced in the Senate have provided the impetus for the majority of programs that fall under these categories.

PDD 39, introduced in 1995, designated what role various government departments would play in the fight against terrorism. This directive divided up

responsibility for crisis management and consequence management to the FBI and the Federal Emergency Management Agency (FEMA) respectively. This meant that the FBI would be responsible for the attempting to resolve a biological terrorist incident before it starts and dealing with its immediate aftermath, and FEMA would be responsible for the long term consequences of the incident.⁵¹ It is not at all clear when a biological incident would cease being a crisis and would become the responsibility of FEMA.

In 1996, Senators Sam Nunn, Richard Lugar, and Pete Domenici created the Defense Against Weapons of Mass Destruction Act. This act called on the DOD to develop a program to teach first responders, including fire-fighters, police, and Emergency Medical Services (EMS), in 120 of the United States' largest cities how to deal with WMD attacks. It called upon several agencies to create a series of exercises which would allow first responders in these cities to practice procedures and identify any shortcomings. The Nunn-Lugar-Domenici plan, as it is better known, also called for the creation of a telephone hotline to assist first responders during WMD incidents, and the development of a "comprehensive list of federal assets available to state and local officials in the event of a chemical or biological terrorism incident."⁵² This legislation directed the Department of Health and Human Services (HHS) to create local medical response teams who would handle any medical situations that might arise immediately after a chemical or biological attack.

Presidential Decision Directive 62 was released in 1998. It dealt specifically with weapons of mass destruction terrorism. This directive reinforced and elaborated upon the previous directive's division of labour.⁵³ It directed the DOD to continue its role of training first responders, and the DOJ to be responsible for supplying equipment to state and municipal authorities. PDD 62 assigned HHS the responsibility for coordinating the medical response to WMD terrorism, and for creating a national stockpile of antidotes, vaccines, and various pharmaceuticals. PDD 62 called for the creation of federal 'rapid

response teams,' but did not specify which departments would be responsible for the creation of these teams.⁵⁴ Finally, PDD 62 called for the appointment of a National Coordinator for Security, Infrastructure Protection and Counter-terrorism to guide and monitor America's expanding counterterrorism programs. This individual would have a seat at the National Security Council (NSC), but would be denied any authority over the counterterrorism budget.⁵⁵

The programs and agencies that have resulted from the implementation of these three acts have turned out to be anything but simple, comprehensive, coordinated, or effective. America's consequence mitigation plans suffer both from chronic mission creep and, paradoxically, from a disregard for some agencies which should have a vital role to play in any bioterrorist incident.

The first responder training called for under the Nunn-Lugar-Domenici legislation became known as the Domestic Preparedness Plan (DPP). The Domestic Preparedness Plan called for first responders in 120 of America's largest cities to receive training in responding to terrorist attack. The decision to give training to cities, and not states or counties, was based on a desire to avoid contact with other levels of government in order to streamline the training process.⁵⁶ This logic led to gaps as large as entire states in DPP's training coverage. These gaps provided justification for the establishment of more training programs and schools for local officials and first responders who might have missed out on the DPP's training programs.⁵⁷

For instance, the Army began to offer training to first responders at its Domestic Preparedness Program at the Soldier and Biological Chemical Command facility. Since 1998, the Center for Domestic Preparedness in Fort McClellan, Alabama has also offered advanced first responder training involving live agent training.⁵⁸

The Justice Department offers a number of training courses as well. In 1997, the DOJ began its Metropolitan Fire-fighter and Emergency Services Program to teach fire-

fighters and emergency medical technicians (EMTs) basic awareness of WMD terrorism. To date, the United States government has invested \$18 million in this program. The Justice Department has also sponsored a program to train sheriffs to better respond to terrorist incidents involving WMD.⁵⁹

To manage the growing number of training programs, the DOJ created the Office for State and Local Domestic Preparedness in 1998. This office coordinates the training courses offered by three universities and two federal agencies. The National Exercise, Test, and Training Center at the Department of Energy's Nevada Test Site offers training for responding to events involving radiological agents. The Center for Domestic Preparedness operated by the DOJ offers chemical explosive training. The National Energetic Materials Research and Testing Center at the New Mexico Institute of Mining and Technology offers courses relating to explosives. The National Emergency Response and Rescue Training Center at Texas A&M University offers courses in providing emergency medical services to victims of terrorist attacks. Finally, the National Center for Biomedical Research and Training at Louisiana State University offers courses in law enforcement and responding to events involving biological agents.⁶⁰ In October of 2000, the DOJ took over the Defense Department's responsibility for administering the DPP training programs.⁶¹ Although this reallocation was done to eliminate extraneous training programs, some confusion will probably follow the transition.

FEMA offers preparedness training to emergency managers and fire-fighters through programs offered at the National Fire Academy and the Emergency Management Institute in Maryland. FEMA also offers courses for emergency managers and fire-fighters at state fire-fighting academies.⁶² The Environmental Protection Agency (EPA) offers hazardous materials training at the Emergency Response Training Program in Cincinnati.⁶³

Had these numerous training programs offered high quality training that included teaching first responders practical techniques to dramatically reduce the damage done in a

terrorist attack involving biological weapons, the inefficient multiplicity of training programs might be forgivable. However, these training programs have had decidedly mixed reviews. While the advanced courses at the Center for Domestic Preparedness are highly esteemed by all, the same cannot be said about the courses offered by the Army that have now been taught to responders in 90 of 120 American cities. The Army granted a contract for DPP training to four private firms: Science Applications International Corporation, EAI Corporation, Booz Allen & Hamilton Incorporated, and Disaster Planning International, Incorporated.⁶⁴ While some instructors working for these firms were said to be quite competent, others were unable to answer basic questions.⁶⁵ The courses were maligned for being rather repetitive, relying too much on extraneous information about the biological properties and military capabilities of certain pathogens, and presenting information about military equipment not available to civilians. The courses were further disparaged for lacking really useful information about planning and logistics, quick rescue techniques, joint response tactics, administering antidotes and medical treatment at the scene of the attack, casualty care, recognizing symptoms, when different levels of decontamination procedures are warranted, and when it is all right to remove one's Level A containment suit.⁶⁶

Besides many agencies offering training of questionable quality, the United States has created a plethora of rapid response teams, also of dubious value, with missions that consistently overlap. A possible reason for this over-abundance of response teams could be that PDD 62 did not specify which government department should be responsible for creating these teams. Consequently, almost a dozen civilian and military agencies have formulated their own response teams.

As already mentioned, the FBI has established a Hazardous Materials Response Unit, which is

(Responsible for providing) technical, scientific response and forensic support to FBI investigations involving hazardous materials including weapons of mass destruction. ... And (to gather and safely transport evidence on-scene that would support criminal prosecution of the perpetrator(s)).⁶⁷

The HMRU may be mobilized within four hours and has access to FBI-owned aircraft which allows it to arrive quickly at the scene of a WMD incident.

The Coast Guard has three National Strike Force Teams located in California, Alabama, and New Jersey. Each of these 36-member teams is trained in HAZMAT operations. Although these teams are intended to respond to oil and chemical spills in American coastal waters, they are equipped to respond to other emergencies involving hazardous materials. Like the HMRU, they are capable of identifying materials, offering technical assistance, and performing site clean up.⁶⁸ The Coast Guard also has 44 Marine Safety Officers, also trained in HAZMAT operations. These Officers may help coordinate response efforts at the scene of a HAZMAT incident, and they are capable of offering assessments of the situation. These officers can deploy within a half hour.⁶⁹

For years, the EPA has had two Environmental Response Teams in New Jersey and Ohio that can respond to a HAZMAT emergency. They have equipment that may be used to identify chemical agents, and decontamination and risk assessment training. The EPA also has ten Superfund Technical Assessment and Response Teams that can respond to HAZMAT emergencies. These teams have decontamination and risk assessment capabilities similar to other response teams.⁷⁰

For decades, the Air National Guard has had 89 civil engineering units located throughout the United States, Guam, and Puerto Rico that are capable of monitoring chemical plumes, identifying chemical agents, decontaminating equipment and personnel, and performing situational assessments. The Prime Base Engineering Emergency Forces, or Prime BEEF, also have 78 fire fighting units trained in HAZMAT operations, and ten Explosive Ordinance Disposal units capable of dismantling WMD devices.⁷¹

In 1995, the Marines assembled the Chemical and Biological Incident Response Force (CBIRF). This unit has nearly 400 people trained to respond to chemical and biological terrorism incidents, with special expertise in reconnaissance, agent detection and identification, casualty treatment, and decontamination. The CBIRF unit has no other responsibility than responding to chemical and biological terrorism incidents. So, while other units in other services may also respond to a variety of incidents involving conventional terrorism or hazardous materials in general, the CBIRFs spending their time training and waiting for these unlikely incidents.⁷² Even though this might mean that the CBIRF unit might never see action, it also supposedly means that they will never be distracted by more minor incidents, and will be ready to respond to chemical or biological terrorism incidents all the more quickly.

The Navy has its own response teams. The Chemical, Biological, Radiological, Environmental Defense Response Teams stationed in Hawaii, California, and Virginia are trained to identify "lingering environmental hazards after a chemical or biological attack."⁷³ A few of the Army's thirty-six 52nd Explosive Ordnance Groups are also trained to handle explosives involving WMD. Like the Prime BEEF units, the National Strike Force teams, and the EPA's Environmental Response Teams, the 52nd existed long before the mad rush to create rapid response teams took place in the mid-1990's.⁷⁴

Long before all of these units with comparable skills and equipment were formed, the US Army had a unit trained in explosive ordinance disposal and the handling of chemical and biological materials. The Technical Escort Unit, (TEU) was formed in 1944 with a

unique, immediate response capability for escorting, rendering safe, disposing, sampling, verifying, mitigating hazards and identifying weaponized and non-weaponized chemical, biological, and hazardous materials.⁷⁵

The TEU is "arguably the military's most capable chemical and biological weapons response team."⁷⁶ It has been deployed to the 1996 Atlanta Olympics, the Democratic Political Convention, and Presidential Inaugurations. The 180-person unit has teams stationed at the Dugway Proving Ground in Utah; Pine Bluff, Arkansas; and Aberdeen Proving Ground in Maryland. Two-man 'reaction teams' may be deployed from any of these sites within minutes of an alert.⁷⁷ Given the TEU's long-standing reputation for competence, experience, and speedy responses it is a wonder that the Pentagon would choose to create a number of other response teams instead of simply devoting more funds and personnel to this accomplished team.

The TEU would likely be the vanguard of the DOD's Chemical Biological Rapid Response Team (C/B-RRT). The C/B-RRT was created to coordinate the actions of military response teams. C/B-RRT is organized to provide a graduated response to a chemical or biological incident. The TEU, trained as it is to respond to a large variety of incidents, would likely be the first team deployed to an incident involving the C/B-RRT.⁷⁸

Perhaps the rapid response teams that have received the most criticism are the National Guard's Rapid Assessment and Initial Detection (RAID) teams, now called WMD Civil Support Teams. In 1997, Secretary of Defense William Cohen directed the DOD to develop a plan to integrate the National Guard into the federal response plans for WMD terrorism.⁷⁹ The plan produced by the DOD led to the creation of the RAID teams. Ten initial teams were stationed in the more populous states of Washington, California, Colorado, Texas, Illinois, Missouri, Georgia, Pennsylvania, New York, and Massachusetts. There are plans to establish 10 more teams, as well as RAID (Light) teams in states without a full RAID team.⁸⁰ These groups would be smaller and would have slightly fewer capabilities and less equipment. In 1999, DOD allocated just under \$53 million for the creation of the RAID teams. In 2000, they spent \$74.7 million on the RAID teams, and in 2001 DOD plans to spend another \$47.9 million on the teams.⁸¹

Although their roles have changed since their creation, the 22-member RAID teams are supposed to be responsible for identifying chemical and biological agents, tracking dispersal paths, evacuating victims, controlling entry to the site of the attack, and especially establishing a mobile communications centre. RAID teams each receive a mobile analytical laboratory and a 'unified command suite' with teleconference and satellite communication capabilities. Their laboratories contain such specialized equipment as gas chromatographers and mass spectrometers.⁸²

Even though the team members undergo hundreds of hours of training, they are often lamented for being quite incompetent.⁸³ This is perhaps due to the fact that team members are only assigned to RAID for three-year terms. This may not be enough time for them to master their complicated mass spectrometers, communications equipment, and gas chromatographers.⁸⁴ This incompetence might be more acceptable if these groups were capable of deploying within minutes to the site of a biological incident, or if they had a function not already covered by other federal response teams. However, they would take up to four hours to deploy to a biological incident, even one occurring in the state where they are stationed, and numerous other response teams have similar functions and capabilities. Of the RAID teams, one local official has remarked, "The good thing about those teams is that it takes them as long as it does to get here."⁸⁵ Because they do take a long time to deploy, most state governments as well as the FBI and FEMA do not "see a role for the RAID teams in the federal response."⁸⁶ Because of their projected limited utility, Congress has been recommended to reassess the need for the RAID teams with a view to restricting the amount of funds devoted towards their creation and maintenance, or deactivating the teams altogether⁸⁷ and redistributing their equipment to other response teams and first responders.

Rapid response teams were created to deploy quickly to the scene of a chemical or biological incident and take over the responsibility of mitigating the consequences of such

an attack from local first responders. To be really useful, these teams should be able to arrive at a site as quickly as possible, because the sooner the victims receive prophylaxis or treatment, and the sooner the agent is identified, the greater the chance the victims have of survival, and the smaller the chance of a secondary outbreak of infection. However, none of these teams, even the dedicated CBIRF unit, is capable of deploying in less than four hours, during which first responders will be overwhelmed trying to decontaminate and treat casualties, identify the agent used in the attack, and ascertain the extent of the damage done themselves.

This is not to say, however, that the rapid response teams will be entirely useless. They all may be necessary to perform a function that is extremely unpopular among all politicians, and not exclusively American politicians. They may be necessary to enforce a quarantine. Nobody wants to be forced to remain in a city or state infected with contagious and deadly biological agents with no food or supplies arriving from the outside world, and any politician that would advocate such a measure would surely suffer a dramatic decline in popularity.⁸⁸ Therefore, no American politicians have so far picked up this hot potato. Nevertheless, in the unlikely event of a release of communicable agents, a quarantine would almost certainly be established. It is better to plan for such a thing now than after a bioterrorist attack occurs when decision makers are pressured to decide how such a thing should be implemented in as short a time as possible. Although none of these teams' mandates involve quarantine enforcement, with the possible exception of the much lamented RAID teams, rapid response teams might be suitable for precisely this task.

The United States has also established extraneous medical response teams. These teams are primarily composed of doctors, nurses, and emergency medical technicians, and are intended to provide emergency medical assistance both at the scene of a chemical or bioterrorist incident, and at local hospitals which would probably be quickly overrun with victims of a bioterrorist attack and the 'worried well.' Even though the United States

already had a number of Disaster Medical Assistance Teams (DMAT), in 1997 the HHS, through the Office of Emergency Preparedness (OEP) established local Metropolitan Medical Response System (MMRS) teams as they were directed to do by the Nunn-Lugar-Domenici plan. HHS plans for a total of 120 of these teams. Each team is composed of local medical personnel, and has been supplied with approximately \$38,000 worth of equipment.⁸⁹ Because these teams are composed of local personnel they would be able to respond quickly to chemical and biological incidents, something that the federal rapid response teams are unable to do.

The OEP also established four National Medical Response Teams (NMRT) in 1997 in Washington, DC, Los Angeles, Denver, and Winston-Salem. These teams are essentially enhanced Disaster Medical Assistance Teams capable of responding to WMD incidents. Besides equipment, these teams have a cache of pharmaceuticals that may be used to treat up to five thousand victims of a chemical attack.⁹⁰

The effectiveness of the DPP and these response teams may be tested in exercises provided by a large number of government bodies. DOD, the U.S. Secret Service (USSS), the FBI, FEMA, HHS, the EPA, the DOE, the State Department, the Department of Veterans Affairs (VA), and the Bureau of Alcohol, Tobacco, and Firearms (ATF) have all sponsored and led training exercises involving Weapons of Mass Destruction terrorism.⁹¹ These exercises are intended to

test and validate policies and procedures, test the effectiveness of response capabilities, and increase the confidence and skill level of personnel. ...They also allow personnel to become familiar with other agencies' procedures and identify those areas needing further coordination.⁹²

Given the glut of federal assets with responsibilities for responding to a bioterrorist attack, such a goal is indeed a worthy one. Between 1996 and 1998 these agencies led 201 exercises. Of these, 116 were tabletop exercises, meaning they were

limited to discussions only; there is no actual deployment of operational or tactical personnel or equipment. Thus table top exercise do not test the government's ability to actually use and coordinate personnel and assets in a realistic setting. However, they are a relatively inexpensive and expeditious way to identify and resolve problems in policies and procedures.⁹³

The other 85 were field exercises, which are performed on location and in conditions that are meant to closely resemble actual field conditions. These exercises may require up to a year of planning to prepare, but, if properly done they will give a realistic view of how a city might respond to a bioterrorist attack and illuminate areas that require improvement. For instance the TOPOFF exercise in Denver highlighted a number of problems with communications, quarantine establishment, and RAID team ineptitude that had previously gone unanticipated.⁹⁴ Both varieties of exercises are an expensive but worthy investment.

However, despite the great number of agencies offering training exercises, all of these exercises seem to suffer due to their overemphasis on the immediate aftermath of a biological incident. For instance the TOPOFF exercise was abruptly ended after only three days, leaving many issues of long-term patient care unresolved.⁹⁵ The contractors who offer the exercises on behalf of the above agencies have also been criticized for offering prosaic and uninformative evaluations and recommendations after the conclusion of both kinds of exercises.⁹⁶

A bewildering number of agencies offer grants to American first responders which may be used to purchase containment suits, chemical and biological identification kits, and other related equipment. The DOD offers cities receiving DPP training a \$300,000 grant to purchase training gear. This equipment is officially loaned to the cities for five years, and the cities are expected to maintain the equipment, replace the items if they should break, and return the equipment to the DOD upon their request. First responders have criticized this grant program for having too many strings attached, and for urging them to purchase inferior equipment, such as military-style respirators and chemical and biological agent

detectors that react to only a few agents, while excluding some commercially available equipment that is "arguably superior to the military items offered."⁹⁷

Cities with MMRS teams receive grants averaging \$300,000 to buy pharmaceuticals and personal protective gear. While this grant program had fewer strings attached, some cities were required to purchase SMART ticket biological agent detectors and Mark 1 nerve agent antidote kits, both of which are notorious for being unreliable. Participating cities were also concerned that they would be held financially responsible for the replacement of expired pharmaceuticals.⁹⁸

The DOJ also administers grants for protective equipment, decontamination supplies, and detection and communications gear. At first these grants were given to a list of 120 localities that was not quite identical to the list of cities receiving DPP training. In 1998, 37 more counties and cities were added to the list to include some areas neglected by the DOD and MMRS grants. Starting in 2000, the grants were given to state-run emergency agencies.⁹⁹ This may result in further confusion for city officials attempting to ascertain what assets would be available to them in times of crisis.

The DOJ grants in particular have been administered in a very slipshod manner. Some cities were given only five days to complete their grant applications, while others were told that their applications required approval from the mayor, department chiefs, and city council. Some applications were first sent to deceased or retired city officials. The list of hundreds of available types and brands of equipment from which the cities and states were expected to choose the best preparedness equipment did not help alleviate the confusion.¹⁰⁰

The United States has even established an extraneous pharmaceutical stockpile. In 1997, HHS created the Office of Emergency Preparedness, and assigned this office the tasks of establishing the four National Medical Response Teams mentioned above, and supplying them with a medical stockpile containing antibiotics, chemical weapon antidotes,

and medical supplies that might be useful in the mitigation of the consequences of a chemical or biological terrorist attack.¹⁰¹ These stockpiles are located in four government-owned facilities throughout the United States, and are maintained by the VA, which has gained some stockpile administration experience while managing its own medical supply stockpile.¹⁰²

In 1999, CDC received \$51 million to establish a National Pharmaceutical Stockpile (NPS). CDC requested \$52 million in 2000 to continue building this stockpile. The NPS would contain much the same items as the NMRTs' stockpiles, with some greater emphasis on vaccines for anthrax, pneumonic plague, smallpox, and tularemia. The CDC has chosen Veterans Affairs to administer this stockpile too.¹⁰³ Precisely why the CDC and HHS thought that another stockpile was necessary is not quite clear when funds directed to the NPS could just have been used to expand the NMRT's stockpiles.

Choosing VA to manage the NPS may not have been the wisest decision. General Accounting Office (GAO) reports indicate that VA has done an extremely poor job of maintaining the OEP's stockpiles. The VA has allowed perishable items to expire, and did not keep accurate records of the items in the stockpiles. It could not even keep track of controlled substances kept in the stockpiles. An inventory conducted by Veterans Affairs itself showed a discrepancy of more than 12%.¹⁰⁴ The VA offered no explanation for the discrepancies, and it remains to be seen if they are more capable of maintaining the National Pharmaceutical Stockpile.

Health and Human Services' NPS stockpile may also be criticized for focusing its vaccine stockpiling initiatives on inhalational anthrax, tularemia, pneumonic plague, and smallpox to the exclusion of other pathogens.¹⁰⁵ For certain these agents are all quite deadly, and preventing an epidemic of any of them would be quite desirable. However, pneumonic plague and smallpox would only ever be used in an extremely improbable macroterrorist attack. Both agents are too communicable to be a logical component of any

other variety of biological terrorism. Smallpox is also very difficult to obtain, being unavailable either from nature or from culture collections. It is unwise to stockpile vaccines for pathogens that are extremely unlikely to be used in a bioterrorist attack, while excluding vaccines for more common agents that may be used in a greater variety of more probable biological attacks.¹⁰⁶

Through the Defense Advanced Research Projects Agency (DARPA), the United States has reportedly financed upwards of 7,000 research and development projects¹⁰⁷ all aimed at developing devices that can identify biological agents, creating new vaccines, providing better physical protection from biological agents, or decontaminating equipment and people who have been in contact with pathogens. For example, along with the United Kingdom and Canada, the United States has begun work on developing a new anthrax vaccine to replace the one developed at the University of Michigan approximately 20 years ago.¹⁰⁸ It has also begun research into environmentally friendly decontamination agents to replace the caustic super topical bleach currently used.¹⁰⁹ Given the massive amounts of resources devoted to such projects in the United States, there have been very few spectacular results from any of these projects.

The U.S. Army has developed a number of biological agent detectors. The Biological Integrated Detection System (BIDS) is a "mobile lab suite that can detect four different agents simultaneously. (It is) mounted on the back of a heavy HUMVEE,"¹¹⁰ and is manned by four specially trained technicians. A similar detector called the Interim Biological Agent Detector (IBAD) is deployed aboard Naval ships. When these devices detect an 'unnatural' agent they sound a warning, then after five to 45 minutes, they provide an analysis of what the agent is.¹¹¹ Although this seems to be reasonable amount of time, as will be shown, it is inferior to the biological agent detectors developed by Canada's Department of National Defence (DND), which were developed with a fraction of the resources. The United States military has also developed an unmanned device called Portal

Shield. A single Portal Shield device is about half the size of an office desk and can detect eight different agents (which is again inferior to Canada's detector). Up to 18 of these devices are meant to be deployed around an airfield or port. Deploying the devices in such an array reduces the possibility of false positives. The military procured Portal Shield devices for use in Operation Desert Thunder in 1998.¹¹² Whether any of these will be purchased for counter-terrorism purposes remains to be seen.

Obviously a device that would be able to ascertain precisely which biological agents were released in a biological attack would greatly assist in the administering of correct antibiotics and vaccines. However, these devices are only suited to identifying airborne agents, as would be released only in military situations, macroterrorist attacks, and perhaps some small scale attacks. They are useless for identifying agents deployed in liquids or solids, and thus would not be at all useful in the more likely kinds of biological crises. Nor does the U.S. military have any plans to develop similar fast-acting biological agent detectors that can identify agents used to contaminate solids or liquids.

To make sense of this disjointed and directionless mess of consequence mitigation efforts, the United States has attempted to impose some coordination upon its extensive terrorism preparedness programs, starting in 1998 with PDD 62's call for the appointment of a National Coordinator for Security, Infrastructure Protection, and Counterterrorism. Richard A. Clarke was the first person to fill this role.¹¹³ The National Coordinator

will oversee the broad variety of relevant policies and programs including such areas as counter-terrorism, protection of critical infrastructure, preparedness and consequence management for weapons of mass destruction ... produce ... an annual Security Preparedness Report ... provide advice regarding budgets for counter-terrorism programs and lead in the development of guidelines that might be needed for crisis management.¹¹⁴

Although this Coordinator has a seat at the NSC, as already mentioned, he has no control over the counterterrorism budget, so he can hardly be held responsible for any financial mismanagement from which these plans might suffer. The National Coordinator is not the top counterterrorism official accountable to Congress, nor is it his responsibility to interact with local and state governments, nor does he manage research and development initiatives.¹¹⁵ A variety of other agencies handle these responsibilities. The National Security Council's Technical Support Working group is responsible for managing R&D initiatives, and the Attorney General, the Director of the FBI, and the Secretary of Defense act as the top counterterrorism officials responsible to Congress.¹¹⁶

The National Domestic Preparedness Office (NDPO) of the FBI is responsible for many coordination tasks. The NDPO was also created in 1998 to be an interagency office with responsibilities for coordinating training and equipment grant programs, providing local responders with a link to the federal preparedness network, and informing local emergency responders understand what federal assets were available to them in times of crisis. The NDPO is required to identify areas in the federal consequence mitigation programs that suffer from mission creep, and ensure that the training received by first responders is of sufficient quality. The NDPO also interacts with local responders.¹¹⁷

The Office of Management and Budget (OMB) has had some counterterrorism coordination duties since it was first tasked to monitor the increasingly unwieldy counterterrorism budget in 1997. Besides monitoring the budget, the OMB is also supposed to be responsible for setting priorities for counterterrorism within the budget.¹¹⁸ Several other individuals and agencies have also been given the task of developing an overarching national counterterrorism strategy, including the National Coordinator, the NDPO, and the Attorney General. Like the NDPO, the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction, also known as the

Gilmore Panel, has been directed to highlight redundancies in the counterterrorism strategy and provide recommendations.¹¹⁹

In 1999 DOD announced the creation of two new positions both intended to coordinate the military's civil support assets with assets offered by other agencies. The Joint Task Force - Civil Support "integrates domestic unconventional terrorism responses from all of the (military) services."¹²⁰ The Assistant to the Secretary of Defense for Civil Support identifies

all of the military's civil support assets and make(s) sure they fit well not only with the other Pentagon elements contributing to the effort, but also with the other support assets scattered throughout the interagency.¹²¹

In 2000, Representative Tillie Fowler proposed adding yet another body tasked with some coordination duties to this already bloated mess. The Terrorism Preparedness Act proposed the creation of the Office of Terrorism Preparedness within the Executive Office of the President. This office would address some of the above fragmentation issues by overseeing policies, objectives, and priorities; publishing a long term Domestic Preparedness Plan and annual strategies for achieving the goals set by this plan; reviewing preparedness programs; and establishing minimum standards for the preparedness programs.¹²² Basically, a lot of tasks already performed by other bodies. Nor would these other coordinating agencies be disbanded or stripped of their duties. Because the Office of Terrorism Preparedness would be only responsible for WMD terrorism issues¹²³ these other coordinating agencies would retain their functions, albeit with the more limited focus of conventional terrorism preparedness. Since the vast majority of terrorism preparedness programs are intended to function in both conventional and WMD terrorist situations, these bodies would continue to have overlapping duties. In a rare display of frugality and forethought, the Senate defeated the Terrorism Preparedness Act.¹²⁴

Like almost every aspect of the American bioterrorism preparedness program, the task of coordination continues to be performed by an unwieldy collection of offices that have carved themselves niches so narrow that their duties are indistinguishable. How can these bodies reduce confusion about counterterrorism programs if it is not even clear which coordinating body is in charge of these programs?

Even though it would be responsible for the long term care of the victims of a bioterrorist attack, and it would be the first body to notice something amiss during a covert attack, the medical community has largely been left out of America's preparedness plans. Hospitals receive the least from equipment grants,¹²⁵ and they are often not asked to participate in training courses or exercises.¹²⁶

For their part, however, America's hospitals have not been overly enthusiastic about participating in the preparedness plan. Due to a dearth of extra staff and extra cash, both private and public hospital administrators are reluctant to let their doctors and nurses take time off with pay to attend training classes. Even if a few emergency room doctors were able to participate in training exercises, they would probably not have the time to teach their colleagues what they had learned.¹²⁷ Furthermore, care of chemical and biological victims is not often taught in nursing classes or medical school. Nor have hospitals been eager to build costly extra decontamination and isolation facilities in their facilities if there is only a slim chance they will ever be used.¹²⁸

In fact, until it was made clear to them that they would get an awful lot of business as a designated 'primary receiving facility' for possible victims of a bioterrorist attack, many private hospitals planned to close their doors to victims of such an attack to avoid infecting other patients and hospital staff.¹²⁹

This cannot be allowed to continue. If American hospitals are overtaxed by yearly 'flu outbreaks, they certainly will not be able to handle the more destructive varieties of biological terrorism. But, it is difficult to persuade hospitals to build more isolation wards

without offering some sort of funds as an incentive. Likewise, it is difficult to convince hospital administrators to let their staff attend training courses if they will not be reimbursed. Therefore, a simple solution to the problem of hospital involvement would seem to be cash grants given to both private and public hospitals.¹³⁰ However, allocating tax money for medical care is not something that many Americans would be willing to do.

Even though it would be responsible for identifying the source of the disease outbreak, and for preventing its spread into other areas, the public health community has also been left out of these response plans until very recently, and consequently has been underprepared. In the TOPOFF exercise, the advice of public health officials was ignored by other participants.¹³¹ Public health lab technicians are not asked to participate in DPP training courses. During a small outbreak of West Nile Virus in the Fall of 1999, the resources of New York's public health network were strained for months.¹³²

However, the United States' public health woes are slowly being given more attention, partially as a result of the West Nile Virus outbreak. This outbreak highlighted the poor communication links between public health agencies and emphasized the need for greater surge capacity among public health laboratories.¹³³ It tested the limitations of America's disease-response capabilities far better than any exercise has to date.

Even the monitoring of animal disease outbreaks has been improved by the West Nile Virus outbreak. Animal health experts noticed that birds and horses were dying from some sort of viral infection long before public health officials were aware that a West Nile-like virus was infecting people. However, the animal health experts' calls to public health laboratories were ignored for longer than a week. This recognized lack of coordination has led to calls for better communications between public health and animal health experts, and greater integration between the U.S. Geological Survey (USGS), which is responsible for tracking wildlife health, and the U.S. Department of Agriculture, which monitors domestic animal health, and the rest of America's counter-bioterrorism plans.¹³⁴

The United States' domestic consequence mitigation plans have few redeeming qualities. They are expensive, too many agencies have essentially identical functions, and the public health and medical sectors have been virtually ignored. But, to answer the question posed during the introduction to this chapter, which of the three general strategies discussed above has the United States followed? This system may be criticized for being too oriented towards responding to macroterrorist attacks because the HHS' stockpiles contain vaccines that would only ever be used in a macroterrorist attack, and no vaccines for more common agents. This system may also be criticized for being too heavily geared towards responding to extortive and overt acts of bioterrorism, because more grants and training are given to firefighters and the police than to the medical sector, which would be exclusively responsible for mitigating the consequences of a covert attack. Likewise, the development of several airborne pathogen detectors but no detectors designed to identify water-borne pathogens or agents deposited on solid materials shows that this system may be too heavily geared towards responding to technically difficult aerosol attacks, while ignoring the more likely possibility of terrorists contaminating solids or liquids with microorganisms.

Whatever the shortcomings of this strategy, the United States has created programs that would significantly decrease the threat posed by four of the seven possible varieties of bioterrorism. Even if single programs focus too intently on one variety of bioterrorism over another, the difference may be made up by other initiatives. For instance, America's international efforts help reduce the possibility of bioterrorism arising from international sources, but the grants given to the FBI allow it to better investigate all varieties of domestic biological weapons incidents. The CDC's controlled substance list contains agents that may be used in instances of product tampering, small scale attacks, and macroterrorism, but not plant or animal pathogens.¹³⁵ However, the increasing

involvement of the USDA and USGS, as well as continued participation in the Australia Group will help reduce the threat of agro-terrorism.

However, these plans do not effectively reduce the threat posed by three varieties of biological events. The American preparedness strategy would be ineffective at preventing non-lethal terrorism, murder, and hoaxes. The CDC does not mention non-lethal pathogens on its controlled substances list, nor are first responders trained to expect this kind of attack, nor are vaccines for these diseases kept in stockpiles.¹³⁶ This system does not do enough to prevent the possibility of murder using biological agents, nor has this been much of a concern at all. Although lethal agents that could be used to murder or assassinate someone are controlled by the CDC, small amounts of these substances are still widely available. A murderer could still order and legally possess enough botulinum toxin to kill a single person if it is explained that the substance will be used for cosmetic medical purposes.¹³⁷

Finally, the United States is the least prepared to meet the most likely threat of all - hoaxes. No matter how much money the FBI is given, it will not be able to prevent all hoaxes. The extensive preparedness plans developed by the Americans actually make hoaxes more tempting to terrorists because they show that the United States is quite fearful of biological attack, and that any biological hoax they perpetrate will inevitably have a tremendously disruptive effect. Hoaxes and murder are the most likely bioterrorist events to occur in the United States, and non-lethal terrorism also has a moderately good chance of occurring. But, the United States is least prepared to meet these threats. It would seem then, that the U.S. has made the considerable error of preparing for the most destructive events, while ignoring the more likely attacks. The situation is not entirely hopeless, however. It is entirely possible, as will be shown in the next chapter, to implement programs capable of reducing the threat posed by murder, non-lethal terrorism, and even hoaxes.

America's preparedness plans are not entirely without merit. Perhaps the best that can be said of them is that they do involve regular field and tabletop exercises. Exercises

can highlight aspects of a preparedness plan that need improving.¹³⁸ For instance, even though it was not really an exercise, the West Nile outbreak has improved the United States' readiness for agricultural terrorism by showing that animal health agencies including the USGS and the USDA ought to be more involved with preparedness plans. If lessons learned from exercises and minor outbreaks are incorporated into future preparedness plans, despite its many faults, the American counter-bioterrorism strategy cannot help but succeed.

Canada's Counter-Bioterrorism Strategy

If the most striking aspect of the United States' bioterrorism strategy is its overabundance of agencies with similar duties, the most striking aspect of Canada's strategy is its minimalist approach to the same tasks. For example, while the United States has twelve civilian and military teams trained to respond to chemical and biological incidents, Canada has but one. Canada's counter-bioterrorist strategy may be summed up by a single phrase: *Maximize existing capabilities.*¹³⁹

Canada's approach has been characterized both by frugality and prudent planning intended to prepare Canada to adequately meet the bioterrorist threat for a minimal outlay of cash. Canada's counterterrorist agencies do not have the same resources at their disposal as their American counterparts, both because Canada's economy is substantially smaller, and because the threat of terrorism in general and bioterrorism in particular has failed to seize the minds of Canada's populace and politicians as completely as it has in the United States.

This does not mean, however, that Canada is ill-prepared to meet the bioterrorist threat, and that it should consider revamping its bioterrorist response programs to more closely resemble the American approach. Recall that the threat of biological terrorism is substantially greater for the United States, and that the American approach is rather wasteful, poorly coordinated, and reflects a lack of overall strategy. Canada's intelligence

community is reasonably confident that Canada's existing preparations are "not out of line with the actual threat."¹⁴⁰ Nevertheless, it would be decidedly chauvinistic of us to assume that these programs are perfect. As may be shown, they might be worthy of as much criticism as the American programs, and, as would be shown in the next chapter, there may be more for Canada to learn from the American approach than just what not to do.

Luckily for our comparison, Canada's counter-bioterrorism strategy may also be divided into the three categories of international efforts, domestic preventative efforts, and domestic consequence mitigation efforts. However, as will be shown, Canada has placed much greater emphasis on international and preventative efforts, and only recently has begun to show more interest in domestic consequence mitigation.

International Efforts

In no way surprisingly, Canada has been an enthusiastic leader and supporter of many international efforts to reduce the threats posed by biological weapons and terrorism. The goal of Canada's efforts in international fora is to erect "a comprehensive international framework of laws designed to combat terrorism."¹⁴¹ Not only does participation in these efforts help to reduce the (minimal) threat to Canadians posed mainly by international terrorists, and for only a small fee, it has also allowed Canada to broadcast to all terrorist groups world-wide that Canada and Canadians would abhor the use of biological weapons and terrorism, and would have little sympathy for anyone who resorted to either.¹⁴²

Like the United States, Canada has been an eager signatory to a variety of counter-terrorism pacts, and a leading participant in many terrorism conferences. In 1995, Canada attended a conference on terrorism in Buenos Aires, along with the United States, Argentina, Paraguay, Uruguay, Brazil, and Chile. Also in 1995, Halifax hosted a G-7 meeting to discuss strategies for combating terrorism. This conference led to the creation of the Ottawa Declaration, which, among other items, called for participants to pursue

measures to prevent terrorist use of nuclear, chemical, and biological materials; to increase counter-terrorism training, and to deprive terrorists of funds. In 1996, Canada participated in the Paris G-7 Ministerial Meeting on Terrorism, endorsing that meeting's declared goal of pursuing international cooperation to reduce the threat of terrorism. Canada has also been the first member of the G-7 (8) to sign ten of the last eleven United Nations counter-terrorism conventions.¹⁴³

In 1997, a Canadian, Phillippe Kirsch, chaired the *ad hoc* group meeting to discuss preliminary drafts of what would become the Convention for the Suppression of Terrorist Bombing Offences. Canada signed this Convention in 1998, and ratified it in 1999. Kirsch also chaired the meetings discussing the Convention on the Suppression of Acts on Nuclear Terrorism,¹⁴⁴ which was in the process of final negotiations in 2000. In 1999, Canada signed the Convention on Terrorist Fundraising.

Canada has also put a lot of time and effort into strengthening the BTWC. The reasoning behind this is that "if state stocks (of biological weapons) are eliminated you would substantially reduce the bioterrorist threat."¹⁴⁵ This confidence in the BTWC's ability to reduce the bioterrorist threat to Canada might be a trifle misplaced. Again, even a BTWC with a mandatory verification regime may be unable to prevent state-run biological weapons programs from operating if inspectors are unable to find all of the state's biological weapons facilities, as they may be unable to do. Furthermore, even if terrorist groups are deprived of the state stockpiles, they can easily purchase cultures from culture collections, or cultivate many varieties from natural sources.

Nevertheless, Canada continues to seek the strengthening of the BTWC. In 1996, along with the United States, Brazil, France, Romania, and the Slovak Republic, Canada lobbied to have the Final Declaration of the BTWC's Fourth Review Conference make mention of a need for the states parties to the convention to adopt measures to prevent the possible use of biological weapons by terrorists.¹⁴⁶

Unlike the United States, Canada has not sponsored collaborative research projects in Russia, either due a lack of funds or the correct belief that the threat posed by underemployed Russian scientists is actually quite minimal. Neither has Canada subjected rogue states to prolonged sanctions simply because it suspects them of sponsoring terrorism. In fact, Canada has been vocally critical of this practise. Former Canadian Minister of Foreign Affairs Lloyd Axworthy has remarked of America's sanctions, "This is bullying ... but in America you call it global leadership."¹⁴⁷ Rather, Canada has sought to reduce the possibility that international terrorist groups will acquire biological weapon from Canadian sources by participating in harmonized export controls through the Australia Group. By not singling any states out for export controls, and just controlling the export of known precursor materials, this arrangement prevents the long-term animosity that comes with unilateral sanctions.

Canada's eager participation in all of these international efforts in no way implies that Canada believes itself to be a likely target of the sort of terrorist groups at whom these initiatives are aimed. Canada is much less threatened by international terrorist groups than the United States. Rather, Canada's participation reflects a belief that:

The problem (of terrorism) is global and the solution must also be global. Our objective can be met by convincing potential terrorists that violence is not only unacceptable to the international community, it is also not a viable solution to political disputes or a remedy to perceptions of disenfranchisement.¹⁴⁸

Although the threat of international terrorism to Canada is particularly low, it should not discontinue its participation in such initiatives. They are commendable for several reasons. Not only do these efforts both help prevent international terrorism and demonstrate Canada's negative feelings towards biological weapons for a minimal outlay of funds, they also, through the Australia Group, help prevent agricultural terrorism by controlling the export of plant and animal pathogens. Nevertheless, Canada runs the risk of relying entirely

too much on the ability of international organizations to reduce the threat of biological terrorism. A greater percentage of Canada's bioterrorist threat originates from within Canada than from without. The United Nations can do little to diminish this internal threat, without a substantial relinquishment of sovereignty.

Domestic Preventative Efforts

In direct contrast to the United States, Canada has placed more emphasis on preventing biological terrorism than on mitigating its consequences.¹⁴⁹ Having said that, this dependence on preventative measures has not been reflected in dramatic increases in funds devoted to Canada's counterterrorism agencies. As is the case with most aspects of Canada's defence,¹⁵⁰ participating agencies are expected to do more with less.

The responsibility for anticipating and investigating possible acts of bioterrorism before they occur falls to Canada's Security Intelligence Service, while the apprehension of such terrorists is the responsibility of the Royal Canadian Mounted Police (RCMP).¹⁵¹ Citizenship & Immigration Canada, the Canada Customs and Revenue Agency, the Communications Security Establishment (CSE), and the Canadian Armed Forces (CF) also have some investigative responsibilities.

Great confidence has been placed in CSIS' ability to "gather intelligence on groups that might pose a threat (to Canada),"¹⁵² and in its recent intelligence sharing initiative with other sectors of government and foreign intelligence services. Since its inception in 1984, CSIS' counterterrorism budget has grown from just 20% of its overall budget to about 60%. However, CSIS' overall budget has not grown much at all. In 2000, only 93 more people worked for CSIS than in 1984. CSIS' annual budget is only about \$157 million CDN, which works out to about \$94 million for counter-terrorism.¹⁵³ Compare this with the FBI's current annual counter-terrorism budget of \$600 million US.

Even though \$94 million seems decidedly small, we must recall that Canada has roughly one tenth the population of the United States. Therefore, Canada should not be expected to collect much more than one tenth the tax money that the United States collects, and Canada's federal agencies should not be expected to have a budget larger than one tenth the size of their American counterparts. When we account for scale in this manner, CSIS' budget does not seem quite so inadequate.

In contrast to the United States, Canada, for the most part, has not implemented strict new anti-terrorism laws since the emergence of the bioterrorist threat. Nevertheless, in 1999 Lawrence MacAuley, Canada's Solicitor General, announced that Canada has plans to toughen up the Immigration Act in order to prevent "terrorists slipping into the country posing as political refugees."¹⁵⁴ The reason behind consciously refusing to create new counter-terrorism laws is that "treating terrorism as an ordinary crime removes the political element and thereby dilutes the effectiveness of the terrorist act."¹⁵⁵ While a terrorism trial would undoubtedly attract public attention, the more mundane crimes of 'murder' or 'arson' would attract a much smaller audience, which is something extortionist terrorists would hope to avoid. Canada uses its "general criminal laws to prosecute offences committed during a terrorist act, such as the crimes of murder, arson, kidnapping, and hijacking."¹⁵⁶ The Security Offences Act of 1984 does not apply specifically to terrorism, but to any

activities within or relating to Canada directed toward or in support of the threat or use of acts of serious violence against persons or property for the purpose of achieving a political objective within Canada or a foreign state.¹⁵⁷

Persons arrested for these activities are tried by the federal government, and not by Canada's provincial or territorial courts.

Canada's federal government is right to declare that its "main focus is to prevent (terrorist) attacks."¹⁵⁸ A well-formulated preventative plan renders expensive and extensive consequence mitigation plans virtually unnecessary. Preventative strategies are so

important that an increase to the funds allotted to CSIS and the agencies listed above would not go amiss. However, given Canada's federal government's current policy of spending restraint, and the absence of a particularly pressing threat, such a thing is not likely to occur.

Domestic Consequence Mitigation Efforts

The most dramatic differences between America's and Canada's response to the bioterrorist threat may be found in their approaches to consequence management. While the United States' approach appears to have given little thought to existing federal assets with counter-bioterrorism abilities, Canada's approach has been to maximize its already substantial response capabilities.¹⁵⁹ Canada's counter-bioterrorism strategy has been to take full advantage the Canadian Forces', the RCMP's, and local police forces' experience with ordnance disposal; Canada's public health community's ability to track disease; and Canada's medical sector's existing but limited capacity to deal with outbreaks of infectious diseases.

Canada has not always had a consequence-mitigation strategy. Until this past year, if first responders in Canada's cities wished to be better prepared to meet the bioterrorist threat, it was up to them to approach their respective city councils, who would then contact Health Canada, Emergency Preparedness Canada, or Defence Research Establishment Suffield (DRES), home of Canada's Chemical and Biological Defence Program, for advice about how best to minimize the consequences of the bioterrorist threat. These agencies would quite willingly provide some advice to the city officials. In particular, scientists from DRES would pay the cities a visit and, while they would not give the cities any equipment, they would inform the first responders about what decontamination equipment can be inexpensively produced "from supplies available at Canadian Tire."¹⁶⁰ Calgary, Ottawa, Quebec City, Vancouver, and Edmonton have all taken advantage of DRES' unique expertise in this manner to help formulate bioterrorism response plans.

Of course, Canada's cities also have had the option of hiring the contractors used by America's DPP program to help create a consequence mitigation plan. However, the services of these contractors would undoubtedly be quite costly, and one is left to wonder if they will take into account the fact that the bioterrorist situation is different in Canada,¹⁶¹ in that Canadian cities are both at less of a risk of bioterrorist attack and have fewer funds available to them for counterterrorism.

Ottawa-Carleton has the country's most advanced plans to mitigate the consequences of a biological event. If nowhere else in Canada, the threat of bioterrorism is taken seriously in the capital region. Health Canada representatives have been included in the planning meetings for this strategy, and the advice of local police, fire, and public health officials have also been solicited.¹⁶² Ottawa's preparedness plans were formulated with great attention to the existing capabilities of the participating agencies. For instance, the Ottawa fire department, like many across Canada, has a substantial capacity to deal with HAZMAT situations that similar in many respects to biological and chemical terrorist situations. Furthermore, the fire department has great experience in maintaining respirators and other protective equipment. Who would be more capable then, Ottawa's planners have decided, of maintaining Ottawa's counter-bioterrorist equipment?¹⁶³ Ottawa's preparedness plans were created to be somewhat of a template for other Canadian cities to follow. Vancouver has also made their counter-bioterrorism plans publicly available on the Internet, so that other Canadian cities may use this plan as a prototype for their own plans.¹⁶⁴

In 2000, Canada announced that it

has launched a policy initiative to develop a strategy to strengthen national counterterrorism response capability, particularly the ability to respond to chemical, biological, radiological, and nuclear terrorist attack.¹⁶⁵

Despite the lack of threat, the Canadian public expects some preparations for this kind of incident. Therefore, the federal government has decided that it will "work with local police and fire departments and emergency health services to develop plans and conduct joint training."¹⁶⁶

In July of 2000, Health Canada created the Centre for Emergency Response. This organization has a mandate of coordinating Health Canada's counter-terrorism activities.¹⁶⁷ It has a lot of big issues to resolve concerning Canada's counter-terrorism plans. For instance, who should pay for DRES scientists to train first responders? Currently, no one does. The participating cities pay for accommodations for DRES staff, and DRES reimburses their representatives for the cost of transportation, but these trips take DRES scientists away from their assignments at Suffield. Ottawa will have to decide whose responsibility it is to pay for this training.¹⁶⁸

Another issue that requires resolution is the question of stockpiles. Currently, the provincial governments would be responsible for paying for any pharmaceutical stockpiles created in Canada.¹⁶⁹ The federal government must consider creating a national pharmaceutical stockpile available to all provinces. Such a stockpile would eliminate the need for each province to acquire their own individual stockpiles, thereby saving millions of dollars. The federal government has some decentralized caches of medical equipment that may be used in a variety of disaster situations. Extra cots, blankets, ongoing patient care and surgical equipment, and some antibiotics are kept in these stockpiles. However, no prophylactics such as vaccines are included in these caches. Nor are there any contingency plans to acquire materials used in the manufacture of vaccines, such as large numbers of chicken eggs, should an outbreak of contagious disease occur in Canada.¹⁷⁰ Studies have shown that "Rapid implementation of post attack prophylaxis is the single most important means of reducing ... losses."¹⁷¹ Therefore, the federal government would be well advised

to look into the possibility of acquiring some vaccines or an expanded vaccine producing capability.

Another issue to be resolved is again the question of quarantine. Whose decision would it be to implement a quarantine - the provincial premier's, or the Prime Minister's? Would quarantine just be handled as a variation of the Aid to the Civil Power plan, or is it sufficiently different to require lengthy discussion in Parliament? Finally, what agencies would be capable of enforcing the quarantine?

Canada is also currently without a plan to deploy teams of doctor and nurses to the scene of a biological attack. In the event of a macroterrorist, non-lethal, or even small-scale bioterrorist attack, large numbers of doctors and nurses will be immediately required to administer prophylaxis, assure the 'worried well,' that they are fine, and identify the causative agents of the disease. There is no time for medical response teams to be requested and formed after an attack occurs. Additionally, the possibility of giving cities or provinces federal grants to purchase equipment that might be useful for responding to bioterrorist incidents must also be discussed. Canada should also discuss the possibility of restricting domestic movement of biological agents.

All of the above issues need to be resolved *before* a bioterrorist attack occurs. It is too late to discuss the pros and cons of quarantine after an outbreak of contagious disease has occurred, and the residents of the infected provinces are already packing their station wagons to head for the hills. It is too late to discuss the necessity of vaccine stockpiles after anthrax has been covertly released in a crowded stadium and thousands of people are beginning to show signs of the disease.

The Centre for Emergency Response has made some progress however, and Canada's medical community probably will not be ignored as pointedly as it has been in the United States. The Centre has begun to implement some pilot projects introducing syndrome-based surveillance into Canada's public health disease tracking capabilities.

Syndrome-based surveillance allows doctors and public health officials to track the progression of a disease by symptoms, even before the causative agent has been identified.¹⁷² It would alert them to the possibility that the symptoms are evidence of an unusual disease outbreak, perhaps purposely created. The old-fashioned disease surveillance system would require the pathogens to be conclusively identified before the case is entered in the system.

Health Canada has also taken it upon itself to

draft a plan to alert doctors, particularly in major urban centres where terrorists are more likely to strike, to the signs of anthrax infection and advise them of the appropriate treatment.¹⁷³

This move was motivated by a perceived lack of preparedness among Canada's community and emergency room physicians. While anthrax is suitable for use in a wide variety of biological incidents, it is not the only agent available to terrorists. Why Health Canada did not train physicians to recognize and treat other pathogens that may also be used in a bioterrorist attack is not at all clear.

Despite their considerably smaller budget, Canada's R&D initiatives have proven to be particularly promising. While it would certainly be cheaper in the short run to purchase protective equipment, biological agents detectors, and decontaminants from foreign suppliers, Canada's mandate to encourage Canadian industry and business growth by backing the development of its own equipment has allowed Canada's research establishments to produce equipment that is uniquely suited to Canadian needs, and that may also be sold to other states. Instead of the 7,000 projects sponsored by DARPA, Canada's chemical and biological research facility at DRES has concentrated on only about a dozen projects. DRES has worked with the United States and the United Kingdom to produce a new anthrax vaccine, and, like the United States, DRES has produced a new decontaminant that is less corrosive to machinery and skin.¹⁷⁴

Perhaps most promising project has been the Canadian Integrated BioChemical Agent Detection System (CIBADS) I and II. Despite Canada's inferior R&D budget, CIBADS has proven itself to be superior to American aerosol detectors in many ways. While the American detectors require up to four trained technicians to operate, CIBADS may be operated, fixed, and reloaded by non-specialists in the field. CIBADS consistently identifies agents faster than any other detector, and it identifies a very broad range of chemical and biological materials. It is robust enough to operate after being dropped off the back of a truck, and is capable of autonomous operation for extended periods of time. As an indication of the precision that it is capable of, CIBADS can distinguish between anthrax and the attenuated strains of anthrax used to make vaccines.¹⁷⁵

CIBADS units are currently available for sale by Computing Devices of Canada in Calgary. The Canadian Forces have purchased two of these units for use on ships assigned to the Persian Gulf,¹⁷⁶ where biological weapon usage is much more likely to occur than in Canada. Again, despite their potential, these devices will not assist in the fight against biological terrorism unless somebody purchases some for use in Canada. However, some people have expressed doubts that procuring such equipment is a good idea at the present time. The bioterrorist threat is forever changing, they reason, and it might be better to wait.

It should be noted that Canada's R&D initiatives are consistently geared towards creating aerosol detectors, due the erroneous assumption that the most likely biological weapons attacks will involve aerosol disseminations.¹⁷⁷ This may be the case in military situations (though some military biological weapons programs have also been unsuccessful in aerosolizing pathogens) but disseminating pathogens other ways is considerably easier, and therefore more terrorist groups will choose alternative dispersal devices.

Unapologetically, DRES has no plans to create detectors that may detect pathogens suspended in liquids or resting on solid surfaces.¹⁷⁸ The old, reliable, but decidedly slow testing procedures, such as were used for the analysis of the blue, powdery substance found

in an envelope addressed to Elinor Caplan,¹⁷⁹ must still be used to identify biological substances in solid or liquid form.

Canada has but one rapid response team for incidents involving biological weapons. In 1994, "Canadian Defence Policy included, for the first time, a specific counterterrorist response support role for the Canadian military."¹⁸⁰ The unit that has been assigned this role is the Nuclear Biological Chemical Response Team (NBCRT). NBCRT is based at CFB Borden, but receives annual live-agent training at DRES, something that many of their American counterparts are not able to do.¹⁸¹ Like most American response groups, the NBCRT may be deployed to the scene of a biological incident within four hours.

It has been suggested that Canada relies too heavily on this one unit.¹⁸² The NBCRT is highly qualified, but what would happen if two or more biological incidents were to occur at the same time in different regions of Canada? Likewise, how would just one unit be able to enforce the quarantine of a city? Like the American rapid response teams, the NBCRT may also be criticized for taking too long to get to the scene of an attack to be of any real use to overburdened first responders.

A shortfall of Canada's preparedness plan is the lack of tabletop and especially field exercises. Although the NCTP calls for regular counterterrorism exercises,¹⁸³ and the NBCRT holds a field exercise annually, these actually occur much less frequently than in the United States.¹⁸⁴ Granted, exercises are expensive to hold, but their capacity for highlighting shortfalls in a state's preparedness plans cannot be matched.

Perhaps due to the relatively small number of participating agencies, one aspect of Canada's preparedness plans that is reasonably clear, especially when compared with the American plans, is what roles will be played by Canada's counter-terrorism agencies in the event of a biological attack. The National Counter-Terrorism Plan (NCTP) has designated the Solicitor General the responsibility to "coordinate ... the full use of all available resources at municipal, provincial, and federal levels to resolve a (terrorist) incident."¹⁸⁵

Accordingly, the Security Offences Act designates the RCMP as the agency in charge of resolving terrorist incidents, although "the (RCMP) and municipal police forces have memorand(a) of understanding describing how law enforcement will be coordinated and who will be in charge."¹⁸⁶ The Canadian Armed Forces are required to "(provide an) immediate response to chemical/biological terrorist incidents in support of the Federal Solicitor General Department."¹⁸⁷ Regional and provincial health authorities would be responsible for the long-term medical consequences of a bioterrorist act, but it is expected that they would request assistance from Health Canada, and would in all likelihood receive it.¹⁸⁸ Emergency Preparedness Canada would coordinate the efforts of local emergency services. The lack of mission creep in Canada's preparedness plans has made the lines of command and communication much more comprehensible than in the United States.

Overall, Canada's preparedness plans are considerably more elegant than their American counterparts. However, there are still many issues concerning quarantine, medical response teams, equipment grants, and the frequency of exercises to be resolved before Canada's programs can really be effective at mitigating the consequences of a bioterrorist attack.

What general strategy has Canada used to respond to the bioterrorist threat? Like the United States, Canada's efforts in international organizations have contributed to the reduction of the threat posed by bioterrorists operating abroad, such as it is. The Australia Group in particular has hampered the trade in all varieties of dangerous pathogens except perhaps non-lethal agents. The Canadian government is reasonably confident that CSIS and the RCMP will be able to apprehend all sorts of bioterrorists before they can perpetrate an attack.¹⁸⁹ The dearth of new laws, and the strategy of using existing capabilities to respond to the bioterrorist threat do not suggest to potential extortive bioterrorists and hoax perpetrators that Canadians are particularly frightened of bioterrorism. These acts would therefore be less disruptive, and are therefore less attractive to terrorists. The increasing

involvement of the health sector seems to indicate that Canada will be as prepared for covert incidents, which are entirely the responsibility of the medical sector, as it is for overt attacks.

There are some aspects of Canada's response strategy that merit criticism. DRES' continued emphasis on creating aerosol detectors to the exclusion of any other type shows that Canada remains locked in the mindset that aerosol bioterrorist attacks are the most likely to occur. Canada's counter-bioterrorist strategy has done as little to prevent murder as the Americans. Like the United States, Canada has failed to restrict the domestic movement of plant and animal pathogens. Given our particular vulnerability to agro-terrorism, this is cause for concern.

Perhaps most frighteningly, however, Canada is quite unprepared for macroterrorism. Canada's single biological rapid response team would not be capable of enforcing a quarantine, as would be required to contain the spread of an infectious disease released during a macroterrorist attack. Canada has no local medical response teams, who would be needed to supplement local doctors and nurses in the event of a large-scale bioterrorist attack. Canada has no vaccines stockpiled, even though prophylaxis is the single most useful method of reducing damage. Canada makes no apologies for not preparing for macroterrorism either. For reasons outlined at the beginning of this chapter, that may not be the safest of strategies.

Although Canada's preparedness plans are prudent, cost-effective, and, with one big exception, appropriate to the level of threat present in Canada, they are far from perfect. They rely rather heavily on international fora to solve a predominantly domestic problem, and macroterrorism is largely ignored as a potential threat. There are many issues yet to be resolved in Canada's embryonic counter-bioterrorism plans. Canada evidently still has much to learn.

Dual-Use versus the Delta

Another way to illustrate the differences between Canada and the United States is by recounting two short stories characteristic of both countries' overall strategies. The first has been excerpted from *Ataxia*, a report written for the Stimson Center by Amy Smithson and Leslie-Anne Levy. It refers to how local first responders chose to spend their equipment grants:

As they reviewed the array of options open to them, local responders put a premium on equipment that could be used for multiple purposes - for instance, detectors that could sense substances other than the classic warfare agents. ... (But when) local responders tried to order dual-use equipment, their requests were often met with stiff resistance from federal authorities. To a certain extent, federal authorities were policing the orders to ensure that purchases had an application for response to an unconventional terrorist event and were not just generic items.¹⁹⁰

In stark contrast, when asked why DRES' chemical and biological research program is now called 'Hazard Avoidance,' Chief Scientist Kent Harding replied that this change was made to get away from the 'NBC mindset,' because there are other threats to defend against, such as endemic diseases and toxic industrial materials. When asked if this larger mandate was part of a strategy to increase funding for DRES, he replied that if it was it has not worked. But, when asked if funding for DRES would have *decreased* if its mission had not grown to encompass these other threats, he conceded that it certainly would have.¹⁹¹

These two stories tell a lot about these two states' approaches. While Canada, presumably in the interests of frugality, has attempted to make sure all of its preparedness programs have some other application besides combating biological terrorism, the federal government of the United States does not want its grants to be used for anything but bioterrorism response. Presumably this decidedly cheap attitude is motivated by a desire for cities to not spend their equipment grants on items that they themselves should raise the

money to pay for, and only on the appointed purpose of counter-bioterrorism equipment. Canada is therefore greatly concerned with having dual-use programs, or programs that have some application besides counter-bioterrorism, while the United States federal government chooses to implement programs that fall into the Delta - programs with no other use besides counter-bioterrorism.

If any of Canada's counterterrorism agencies wish to increase Canada's bioterrorism response capabilities, they must be certain to state that their proposed programs will also be useful for responding to situations like 'flu epidemics or earthquakes.¹⁹² In the United States, the health care community has quietly applauded the capacity of the bioterrorist threat to unintentionally motivate the federal government to increase health care spending and improve public health capabilities.¹⁹³ One state uses biological terrorism as a justification for increased spending on other capabilities, the other state uses other capabilities as justification for increased spending on biological terrorism.

However, biological terrorism cannot be prepared for by focussing on just the Delta or just dual-use programs. A successful preparedness program must contain elements of both strategies. For example an ideal counter-bioterrorist strategy would contain an advanced disease surveillance system, which may also be used to track natural disease outbreaks, and a capacity to diagnose unusual diseases, such as inhalational anthrax and smallpox, which would probably have no other applications besides counter-bioterrorism. Any approach that focuses on one strategy while ignoring the other is doomed to failure.¹⁹⁴ However, both Canada and the United States are lucky: they each have a neighbour who has adopted the opposite dual-use-versus-the-Delta strategy from their own. Therefore, to substantially improve their response capabilities, all either has to do is examine the other's preparedness strategies, and imitate them where appropriate.

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Chapter Three - Recommendations and Conclusions

Although both the United States and Canada have undertaken extensive plans to combat the threat of biological terrorism, neither country's counter-bioterrorism plans are above reproach. This chapter will discuss possible methods to improve both systems so that they will be better able to address the threat of bioterrorism. This chapter will also endeavour to answer the question posed at the beginning of this study - 'Which state's response is best suited to dealing with the threat of bioterrorism as present in that state?' - by reviewing the evidence presented in the two preceding chapters.

When suggesting possible improvements to Canada's and the United States' counter-bioterrorism plans, it is important to consider the feasibility of such modifications. For a variety of reasons ranging from economic constraints, to a reluctance to make any concessions to unfriendly states, to the influence of powerful bureaucrats who stand to lose a great deal from extensive reforms, politicians and the people they lead may be unwilling to implement changes that might otherwise be capable of perfecting a counter-bioterrorist strategy.

Many authors fail to acknowledge this reality. Consequently, they recommend corrective courses of action that offer quick fixes to complicated problems, but have absolutely no chance of ever being implemented. For example, one author has suggested that a possible solution to the problem of preventing right-wing extremist terrorism would be to lift constitutional restrictions on intelligence probes into extremist groups; to suspend Militia members' rights of privacy; to collect and publicly divulge "all that these groups and their individual members say at meetings, write in pamphlets, even say to each other on the telephone;"¹ to broaden anti-sedition laws in defiance of the First Amendment; and to give anti-terrorism organizations the freedom to take whatever actions they desire to terminate domestic terrorism. These recommendations display a frightening disregard for

popular beliefs in the inalienable rights of freedom of speech and privacy, as embodied in the American Constitution. These plans could never come to pass. Few Americans would support such draconian and grossly unconstitutional measures, and no politicians seeking reelection would promote them for long either. These recommendations are entirely unfeasible, and we are left to wonder what possible purpose advocating such implausible courses of action could possibly serve.

Recommending impossible improvements does very little good. It creates false hopes for the capacity of government to address these problems, and bitter disappointment when the benefits that these corrections promise fail to materialize. Therefore, when making recommendations about possible corrective courses of action, this chapter will pay particular attention to the feasibility of such actions. Doing so will exclude the possibility of introducing any all-encompassing, overly simplistic quick fixes of the type mentioned above, but maybe this is for the best. Maybe there are no easy answers to these problems.

Possible Improvements to the United States' Counter-Bioterrorism Strategy

The failings of the American counter-bioterrorism program may be attributed to several overarching causes, all of which have interacted to produce the situation noted in Chapter Two. As some authors have suggested, the American programs are poorly organized and have no overall plan to coordinate the actions of involved agencies.² This has led to the creation of a directionless system that is rife with mission creep and ironically suffers from the lack of involvement of a few key agencies such as the CDC and HHS. In the absence of an overall plan, law enforcement and defence agencies have been able to secure extensive funding for glamorous pet projects, such as the innumerable rapid response teams, with questionable value to the counter-bioterrorism effort, but public health departments in many states continue to be understaffed and overworked³ because they have been unable to secure increases in funding that might allow them to better

monitor disease outbreaks.

The problems of the American system have also been attributed to a poor understanding of which terrorists and which forms of terrorism are most threatening to the United States. This has led to a widespread but disproportionate fear of biological terrorism arising from international sources, such as from international terrorist groups with state sponsors,⁴ or from Russian scientists offering their services to terrorist groups, even though the bulk of the bioterrorist threat arises from domestic sources. This disproportionate fear of international terrorism has led to the creation of overly harsh measures designed to combat biological terrorism internationally.⁵ As suggested in the last chapter, a poor understanding of which forms of bioterrorism are most threatening to the United States has also led to numerous measures designed to combat macroterrorism, the most destructive but least probable form of bioterrorism, at the expense of preparations for the more mundane types of bioterrorism such as murder, non-lethal bioterrorism, and hoaxes.⁶

The problems of the American system may also be attributed a lack of education and perspective about biological terrorism both among the government and the populace in general. A bioterrorist act is quite unlikely to occur, yet American politicians appear on news shows brandishing bags of sugar and prophesying, "The question is no longer if this will happen, but when."⁷ Is it any wonder then that Americans now consider terrorism, and specifically chemical and biological terrorism, to be the greatest threat to the United States? Such a lack of perspective among the general population has, arguably, led to overspending on counter-bioterrorism programs and, somewhat ironically, a great fear of biological terrorism that has increased the vulnerability of the United States to hoaxes and extortive acts of biological terrorism.⁸

Many analysts have offered suggestions that might correct these failings. Some of these suggestions are quite infeasible, while others suffer from just as much improper

understanding of the major sources of the bioterrorist threat as the programs they are intended to fix. For example, even though the threat of Russian scientists selling their services to terrorist organizations has been shown to be quite exaggerated, Amy Smithson has suggested increasing the funding to collaborative research programs in Russia by at least 250% to make sure that each of Russia's 7,000 former biological weapons program employees are kept in the manner to which they had been accustomed, so that they do not fall victim to the temptation of terrorist money.⁹

Still other suggestions are suggestive of government departments continuing to angle for their share of bioterrorist funding. For example, recent articles have suggested that the USDA, the most recent addition to the family of diverse agencies involved in counter-bioterrorism, is in dire need of its own rapid response teams to respond to agricultural emergencies.¹⁰ Why a TEU or CBIRFs team assisted by a veterinary pathologist or phytopathologist would not be capable of handling such an emergency is unknown. This suggestion leaves us to wonder which department will be the next to demand funding for yet another unnecessary rapid response team.

Some recommendations for improvements are just poorly conceived. For example, the Joint Chiefs of Staff themselves have suggested that the United States could use its nuclear arsenal to deter non-state actors from engaging in terrorism against the United States. For two reasons, this is quite preposterous. First, a terrorist base, if such a thing can be found, would probably be surrounded by innocent civilians.¹¹ Second, it is difficult to

deter adversaries whose responses are not rational. ... (Some groups) have little to lose and are therefore hard to deter. Religious extremists, similarly, may be actively aiming for chaos or, in some cases, for martyrdom. It is hard to deter a group that is seeking to bring on Armageddon.¹²

An appeal to rationality such as deterrence will be meaningless to a group that does not use a rational cost-benefit analysis to govern its actions.

Some authors have offered sensible and feasible recommendations for the improvement of the American counter-bioterrorism strategy.¹³ Their suggestions will be integrated into the proposal offered here.

As suggested in the last chapter, one possible model to follow when deciding on ways to improve the American counter-bioterrorist strategy may be the Canadian approach. This is not to imply that the Canadian counter-bioterrorism strategy is perfect, nor that such a low-key approach is suited to combating the much larger threat to the United States, but Canada has taken a dramatically different approach to this problem, focussing more on dual-use projects than the Delta, and the United States may learn a great deal from Canada. In turn, Canada may learn a great deal from the United States and its focus on the Delta. This does not mean that both countries should homogenize their counter-bioterrorism response: The threat of bioterrorism to Canada and the United States is far too distinct for us to recommend identical responses, but both states may learn a great deal from a dramatically different approach to a similar problem.

Our proposals for improvements to the American counter-bioterrorist strategy may be divided into recommended changes to changes to preventative efforts, changes to domestic consequence mitigation efforts, and changes to international efforts. Because the American consequence mitigation strategy needs the most work, it will be dealt with first.

Domestic Consequence Mitigation Efforts

The American consequence management requires extensive alterations before it can effectively minimize the consequences of a bioterrorist attack. These improvements must begin with the implementation of a cost-saving plan and the creation of a single coordinating body for the United States' counterterrorist efforts. Once these two changes have been made, opportunities will present themselves for the further improvement to the American strategy. These further improvements should include reductions in the number of

redundant medical response teams, first responder training programs, medical stockpiles, grant programs, interagency exercise programs, and rapid response teams; the development of a quarantine policy; the elimination of poorly managed programs; a revision of the contents of the medical stockpiles to include generalized vaccine-producing materials; more attention and funding devoted to the medical and public health sectors; an examination into why American R&D establishments have been less successful than their underfunded Canadian counterparts; and an education program to teach the American public about the threat of biological terrorism and the response capabilities of the American government.

An aspect of the Canadian response to the bioterrorist threat that the American government would do well to emulate is Canada's careful consideration of existing assets¹⁴ and the establishment of priorities for the counter-bioterrorist strategy. This strategy has allowed Canada to mount an effective but inexpensive defence against biological terrorism. If the United States were to follow a similar tactic and perhaps integrate this philosophy into carefully formulated plan, it too could eliminate wasted spending and identify which areas of its response strategy require greater attention.

Despite calls for such a cost-saving plan arising from both government and private sources,¹⁵ such a thing has not yet come to pass. True, several pieces of legislation and presidential decision directives have been passed that somewhat direct the actions of some agencies,¹⁶ but these have so far lacked a proper understanding of the major sources of the bioterrorist threat, do not clearly delineate which government departments are responsible for which tasks, and do not establish priorities for the American response.

A new all-encompassing plan must be created to give some direction to the American counter-bioterrorism response. Such a plan would ideally identify the sources of the bioterrorist threat, include an assessment of which forms of bioterrorism threaten the United States, clearly delineate departmental responsibility, establish priorities for the

American response strategy, and have a mechanism for periodically reviewing the programs created by the counter-bioterrorism strategy. If such a thing were implemented, the American government may come to realize that the bioterrorist threat is more of a domestic problem than an international one, that there are more kinds of biological terrorism than macroterrorism, that too much funding and consideration is devoted to rapid response teams and not enough to HHS and the CDC, and that too much money is wasted on repetitive preparedness programs.

It may be difficult to implement such a plan. Many influential people and departments have profited greatly from the disordered administration of Americas' counter-bioterrorism programs. In the absence of a plan that clearly delineates responsibility, many government agencies have secured funding for expensive projects of questionable utility.¹⁷ If an overarching plan is created, these agencies stand to have funding diverted from their projects to less glamorous projects controlled by departments in dire need of more funding. Departments that have profited quite nicely from a disordered counter-bioterrorism strategy may protest the creation of an overarching plan, perhaps on the basis that implementing such a thing may be costly and time consuming,¹⁸ or that the interests of their departments are not adequately represented in whatever form the final draft of the plan might take.

Nevertheless, such a thing may indeed come to pass during the presidency of George W. Bush. Recall that President Bill Clinton himself provided the initiative for many of the counter-bioterrorism programs implemented during the 1990's. He formulated both PDD 39 and 62, and it was his idea to create vaccine stockpiles, reportedly after reading The Cobra Event, a novel by Richard Preston about a

terrorist attack on New York City with a genetically engineered mix of the smallpox and cold viruses. Mr. Clinton was so alarmed by the book, his aides said, that he instructed his intelligence experts to assess its credibility and urged Speaker Newt Gingrich ... to read it.¹⁹

It has even been suggested that since the World Trade Center bombing in 1993,

(f)or a new President in search of leadership credentials, the fight against terrorism became a cure for policy impotence and a welcome political platform. ... (The fight against terrorism) filled a policy vacuum created by the loss of the arch enemy of the United States, the Soviet Union.²⁰

It is entirely possible that Bush will not share Clinton's interest in biological weapons terrorism. He may identify other priorities to which American tax dollars should be devoted. Should this be the case, the new president may indeed advocate the creation of a plan that consolidates the United States' counter-bioterrorism efforts into a less costly, but still effective, form. However, before we begin celebrating the impending creation of such a plan, we must remind ourselves that Republicans are not known for supporting health care spending, nor for frugality when it comes to defence matters.

An ideal counter-bioterrorism plan would call for many changes to the existing counter-bioterrorism strategy. The implementation of such a plan might begin with the creation of a single body responsible for coordinating the United States' counter-bioterrorism efforts, and the elimination of other positions with similar duties. This body would be responsible for all the leadership duties now performed by a panoply of other agencies. During the 1980's, a similar position was created to coordinate the national drug control effort, which was also suffering from a lack of direction. The Office of National Drug Control Policy (ONDCP) is part of the Executive Office of the President and not an agency of the DOD, DOJ, or HHS. This independence has allowed it to "rise above the particular interests of any one federal agency."²¹ It is the top counterdrug agency accountable to both the President and Congress. It sets priorities within the national counterdrug strategy, monitors the counterdrug budget, manages R&D initiatives, provides assistance to state and local governments, monitors the performance of various counterdrug

programs, and creates international counterdrug programs.²² As we saw in the last chapter, similar counter-bioterrorism coordination duties are now performed by at least ten diverse agencies.

Since its establishment in 1988, the ONDCP has succeeded in developing a national drug control strategy with short- and long-term objectives, created performance indicators for this strategy, taken over the management of the United States' \$20 billion drug control budget, and coordinated the efforts of over 50 government agencies involved in drug control.²³

Congresswoman Tillie Fowler proposed a similar initiative in 2000. However, her proposal limited the responsibility of the Office of Terrorism Preparedness to terrorist events involving weapons of mass destruction. The bodies responsible for responding to conventional terrorism would still exist, as would the National Domestic Preparedness Office in the DOJ. Since these agencies would continue to operate, the Office of Terrorism Preparedness would be unable to reduce much of the confusion currently vexing the counter-bioterrorist strategy.²⁴ Consequently, the bill proposing the establishment of this new office was defeated in the Senate.

But, a single coordinating body with duties similar to those of the ONDCP may be just what is needed to bring some order to the American counter-bioterrorism efforts. However, so that the bill introducing this position is not defeated for the same reasons that congresswoman Fowler's was, this new office should be responsible for all domestic counter-terrorism programs, and it should call for the deactivation of all rival coordinating bodies with similar capabilities and duties.

Like the ONDCP and Representative Fowler's suggested position, the new office should be a part of the Executive Office, again so that it cannot be criticized for overrepresenting the interests of one government department.²⁵ This new office should be the top counter-terrorism agency accountable to Congress. A representative of this office

should also have a seat at the NSC and be accountable to the President.

Currently, the National Coordinator for Security, Infrastructure Protection and Counterterrorism has a seat at the NSC and acts as the top counterterrorism official accountable to the President.²⁶ So that both offices do not have identical responsibilities, the position of National Coordinator should be integrated into this new office, possibly in the capacity of the chief representative of this office. Failing this, the position of National Coordinator should be eliminated altogether to alleviate mission creep.

The new counter-terrorism office's first duty should be to assess the threat of biological terrorism and then, based on this assessment, to set priorities for the counter-bioterrorism strategy, paying particular attention to the clear allocation of departmental responsibilities. These changes would bring to light redundant programs and gaps in readiness, and give an overall direction to the counter-bioterrorism strategy. Responsibility for the management of its own budget would help this office reduce unnecessary spending on superfluous counter-bioterrorism projects, especially if the office's budget administrators were aware that they could lose their jobs if it was found that they had mismanaged their finances. An independent review commission, perhaps comprised of representatives of the OMB, could regularly monitor the effectiveness of this office's counter-bioterrorism plans and the management of its budget, and present these findings to Congress for review. The new office would interact with local first responders and be responsible for training and exercises. It would administer federal grant programs and funding for R&D. These measures would reduce many redundancies and much of the confusion about grants, training, and exercises currently experienced at state and local levels.²⁷

During a bioterrorist event this new office should exercise control over all federal assets, including those controlled by DOD. The Pentagon may oppose the idea of relinquishing control over its rapid response teams to a civilian agency, regardless of

whether the Executive Office is supposed to have ultimate control over the armed forces. To appease these concerns, this new office may have to be staffed by at least a few representatives of the armed forces. So that DOD is not overrepresented in this supposedly neutral office, representatives from other agencies involved in counter-bioterrorism might also be included in the staff of the new office, making it more of an interagency office than an independent part of the Executive Office. However, the new office should remain as independent as possible in order to avoid the problems with pork-barrelling that have plagued the United States' counter-bioterrorism strategy until now.

So that identical duties are not performed by two or more agencies, some existing coordinating bodies should be disbanded or subsumed under the banner of the new agency, while others should just be stripped of their counterterrorism duties. With the creation of this new office, there would be no reason to retain the FBI's National Domestic Preparedness Office, nor DOD's Joint Task Force - Civil Support, nor the Assistant to the Secretary of Defence for Civil Support. The Attorney General, DOJ, the Secretaries of Defence and State could be relieved of some of the counter-bioterrorism duties they now perform. The OMB would no longer be required to set priorities for counter-terrorism programs, though it may have to retain its responsibility for monitoring the budget.²⁸

While the creation of yet another coordinating office is unlikely to be objectionable to most agencies, some groups may protest the elimination of other coordinating bodies if it means that they stand to lose influence over the United States' counter-bioterrorism plans. For instance, DOJ would likely object to the elimination of the NDPO because in all likelihood they would lose control over counter-bioterrorism plans involving their own resources. This department and other agencies with responsibility for coordination might strenuously object to this proposal, and it would be necessary to assure them that they would continue to have influence over counter-bioterrorism activities, if only through their representatives at the new office. Nevertheless, the objections of these influential

departments might make the establishment of a new, overarching coordinating body difficult, if not impossible.

A counter-bioterrorism plan, as may be developed by an overarching coordinating body, should also call for several other changes to the American strategy. It should attempt to reduce some redundancies. Are two vaccine stockpiles containing similar supplies really necessary? Are three kinds of medical response teams with virtually identical duties necessary? Do five agencies have to offer first responder training programs? Do ten departments have to offer interagency training exercises? Are three kinds of grants to first responders in large cities necessary? Finally, and most importantly, are twelve kinds of rapid response teams with similar capabilities and duties really necessary?²⁹ All of these superfluous assets could each be consolidated into one big vaccine stockpile, training program, rapid response team, and so on, thus reducing administrative costs and the rampant confusion that so many local authorities feel regarding the American consequence mitigation programs.

Even though the United States would be well-advised to consider the consolidation of its vaccine stockpiles, response teams, grant programs, and so on, it should think twice before liquidating the assets held by the redundant stockpiles, decreasing the funds available to the grant programs, or reducing the manpower available to the medical or rapid response teams. Instead of being eliminated, these extra supplies, funds, and positions should simply be integrated into the single remaining stockpile, grant program, or response team. Confusion and administrative costs will still be reduced, but the previous capability would remain. The American public has shown that it is willing to pay for these assets, so why not have a huge pharmaceutical supply, why not continue to offer millions in federal grants, and why not have a rapid response team capability comprised of hundreds of people? In the event of a biological attack, larger assets of these types are always preferable to smaller (especially, in the case of rapid response teams, if a quarantine is to

be enforced). As long as the American public is willing to pay for these programs, their capabilities may remain high, and questions of appropriateness to the level of threat need never be considered. In the event that the American public becomes unwilling to pay for such extensive programs, as they might if a proposal to be introduced later in this chapter is implemented, these assets may certainly be reduced at the discretion of the American people.

As with the proposed consolidated coordinating body, government departments removed from the medical response team, rapid response team, training, exercise, stockpile, and grant programs equations will likely vehemently object to these cuts because they stand to lose a great deal of funding and influence over the American consequence management plans. For instance, if all funding formerly given to all the armed services to pay for their respective rapid response teams is suddenly redirected to the Army's TEU as the sole remaining rapid response team (as it arguably should be, given the TEU's superior experience and capabilities),³⁰ the Navy, the Marines, the National Guard, and the Air Force will protest. They will decry these efforts at consolidation for their short-sighted attempts to remove the unique capabilities of their teams from the American consequence mitigation strategy. But this argument holds little water: as already mentioned, there is little actual difference between the current capabilities of the United States' rapid response teams. All have some capability to decontaminate affected areas, identify pathogens, and conduct operations while fully protected by Level A protection suits.³¹ Even if these rapid response teams actually do have a unique capability, such as Prime BEEF's chemical/biological plume monitoring skills³² or CBIRF casualty decontamination skill,³³ there is no reason these skills cannot be acquired by members of the consolidated team.

Although the rapid response teams should be consolidated into one large team, individual units belonging to this team should not be kept in a single centralized location. Rather, rapid response team units should be spread throughout military bases throughout

the United States. This would allow these teams to respond to biological events faster than the minimum four hours it currently takes all rapid response teams to arrive at the scene of an incident.³⁴ Arriving earlier would allow rapid response teams to take over from overwhelmed local first responders and assess the situation earlier, and begin prophylaxis and containment procedures sooner. To further reduce response time, the commanders of this new team should consider making some of their units into a dedicated force, perhaps along the lines of the CBIRF units.³⁵

One rapid response team that should certainly be deactivated is the National Guard's WMD Civil Support Team (formerly known as RAID teams). They are regularly criticized for being incompetent, and their utility during a biological crisis would be questionable.³⁶ The WMD Civil Support Team's only truly unique capability is the provision of a highly advanced communications centre for agencies responding to a bioterrorism event.³⁷ If there is only one kind of rapid response team, one kind of medical response team, one coordinating body, and one office to call to gain access to a vaccine stockpile, as there would be if the efforts at consolidation called for above take place, surely such advanced telecommunications capabilities are not necessary. The one remaining rapid response team could probably handle communications for its own troops, and the coordinating agency could manage communications among other involved agencies.

However, deactivating the WMD Civil Support Teams is not just a matter of disbanding the units and dividing up their equipment among other rapid response teams. Under the terms of the *Posse Comitatus* Act, in order to protect the civil liberties of the American people, federal military personnel are prohibited from “being used for law enforcement within the United States.” Officially, National Guard teams, which are state assets, would have primary responsibility for responding to bioterrorist incidents, while CBIRF units, the TEU, and other military rapid response teams would play a supporting

role. Removing the National Guard's capacity to respond to bioterrorist incidents, thereby forcing the Army, the Marines, or the Navy to assume responsibility for responding to homeland bioterrorist incidents, would violate the *Posse Comitatus* Act, and attract criticism from civil libertarians.³⁸

While on the subject of response teams, a few words should be said about quarantine. Even though a bioterrorist event involving a contagious pathogen is extremely unlikely it would be unwise for any government not to have a quarantine policy. Such a policy should address such questions as who has the power to call for a quarantine: the governor, the president, or the CDC?³⁹ Just as importantly, who has the power to lift a quarantine? Who will enforce the quarantine? (Presumably, the large, consolidated rapid response team will perform this duty. The need for a force capable of containing the inhabitants of a city or even possibly an entire state is a strong argument in favour of retaining a large number of rapid responders.) How will supplies reach the quarantined area?⁴⁰ How will quarantine breakers be punished? As already mentioned, discussing quarantine is political suicide.⁴¹ No politician wants to discuss this controversial issue for fear of losing popularity. Therefore, perhaps this issue should not be discussed in a public forum. Innumerable policies pertaining to national security and terrorism are formulated without the benefit of public scrutiny.⁴² There is no reason that a politically unpopular but important issue such as quarantine policy could not be dealt with in this manner as well. To make sure that the interests of all agencies likely to participate in a quarantine are taken into account by the new policy, HHS, DOD, DOJ, state and local governments, and especially the CDC should be allowed to participate in whatever discussions regarding the quarantine policy take place.

While in the process of consolidation, America's vaccine and pharmaceutical stockpiles should revamp other aspects of their administration. Since the VA has proven itself to be incapable of properly managing both the Office of Emergency Preparedness'

National Medical Response Teams pharmaceutical stockpiles and the Marines' CBIRF stockpile of medical supplies,⁴³ the United States should consider finding another body to administer these supplies. To lessen the waste that occurs when stored pharmaceuticals are not used before their expiration date, the stockpile administrators should consider establishing "pharmaceutical bubbles."⁴⁴ A pharmaceutical bubble would be stored at local hospitals. These hospitals would consume the pharmaceuticals in the normal course of treating other diseases and replenish what is used at their own expense. Thus, the shelf of perishable pharmaceuticals may be extended indefinitely.⁴⁵

The contents of the pharmaceutical stockpiles might be revised too. Currently, the HHS' stockpiles are "geared in part"⁴⁶ towards providing vaccines for inhalational anthrax, pneumonic plague, smallpox, and tularaemia, all of which are difficult to obtain and weaponize, and few of which would be suitable for use in any sort of attack except macroterrorism. There are hundreds of pathogens that are more likely to be used in a bioterrorist attack than these, yet the pharmaceutical stockpiles contain no prophylactics for these other diseases. This failing should be corrected. Either vaccines for other potential biological weapons should also be included in the stockpile, or materials that could be used to quickly manufacture vaccines for a great variety of diseases should be stockpiled. These materials might include growth medium for bacterial diseases, test tubes, incubators, and a 'bubble' supply of chicken eggs,⁴⁷ which may be used to produce viral vaccines.

This does not mean that the vaccines for the rare diseases mentioned above should simply be discarded. Since these vaccines have already been purchased, there is no reason not to keep them. Furthermore, the devastating effects that an outbreak of these diseases might produce is reason enough to retain a capability for vaccinating against these pathogens. However, the focus of the vaccine stockpiling efforts needs to move away from these unlikely weapons to a more generalized approach.

A more generalized approach to pharmaceutical stockpiling may indeed be more

costly than purchasing just four varieties of vaccine. However, the pharmaceutical initiative in its entirety does not have to cost more money. The recommended stockpile consolidation would reduce administrative costs, and the proposed pharmaceutical bubble will reduce the amount of money spent on replacing expired medicine. These extra funds might be spent on changing the focus of the vaccine stockpile.

Like the pharmaceutical stockpiles, other aspects of the American consequence mitigation strategy, including the training programs and the grant programs, have been criticized for being poorly administered.⁴⁸ To correct this problem, stockpile, grant, and training programs that were not well-organized or efficient could be eliminated, and the funds freed up redirected to the surviving programs.

Counter-bioterrorism funds that are saved by consolidating consequence management efforts may be redirected to improving disease surveillance and identification, funding biological weapons response training programs for doctors and nurses, paying the same to attend these courses on their spare time, establishing a grant for the construction of more isolation and decontamination facilities in hospitals, and other programs involving public health and the medical sector. These programs would allow the DPP to better mitigate the long term consequences of bioterrorist attacks,⁴⁹ and assist in the response to covert bioterrorist attacks.

However, even if no extra funds have to be diverted to the counter-bioterrorism strategy to pay for these programs, their proponents may have difficulty obtaining support for them, both from the government and from the public in general. 'Socialized' health care is a "political non-starter"⁵⁰ in the United States, especially when both Congress and the White House are controlled by the Republican party. Thus, these programs may be infeasible no matter how beneficial they may be.

Nevertheless, counter-bioterrorist programs that may be classified as public health ventures have been successfully implemented in the United States before. Medical

response teams and the pharmaceutical stockpiles are both intended to enhance the United States' medical response to a bioterrorist event, and they may be useful in a variety of other medical disasters as well. As expected, their creation was opposed by several groups, including Senators, military officials, and scientists,⁵¹ but their potential usefulness in a wide variety of situations convinced the American government to implement these programs in spite of these protests. Luckily, the health care programs discussed above would also be extremely useful in a variety of medical situations, including bioterrorist incidents. Therefore, their implementation is entirely possible.

DARPA, the agency in charge of American counter-bioterrorism R&D initiatives, provides funding for around 7,000 projects,⁵² yet very few of these projects have offered results anywhere near as promising as Canada's CIBADS unit. Either DARPA, the National Security Council, or whatever coordinating bodies remain after the proposed consolidation efforts conclude should examine why they have had so few spectacular results when the underfunded Canadian defence research establishments have had so many. A comparison of DARPA's efforts with Canada's might yield some interesting possible reasons for the differences in performance, and offer suggestions for improvements. Furthermore, DARPA would do well to consider the creation of a device that can quickly identify and detect pathogens placed in water or on solids. Many more bioterrorist events are likely to involve pathogens disseminated in ways other than aerosol means, but both DARPA and Canada's defence research organizations continue to focus on aerosol detectors.⁵³

Another possible result of the proposed assessment of the threat of biological terrorism referred to above may be that the American government will come to realize that it has grossly misrepresented the threat of biological terrorism to the American people. Until now, representatives of the American government have written articles and appeared on television asserting that it is only a matter of time before the population of the United

States is decimated by a bioterrorist attack.⁵⁴ Similarly, they continually declare that the United States is grossly unprepared to meet such a threat.⁵⁵ After performing an assessment of the threat of bioterrorism, the American government may come to realize that both statements are gross exaggerations.

In order to correct the damage done by earlier television appearances, the American government may decide to present a more accurate picture of the threat of biological terrorism and the United States' response capabilities to the American people. It may wish to tell them that a bioterrorist attack is in no way imminent and, to put the threat in perspective, that an act of conventional terrorism is still many times more likely to occur. It may wish to inform the people that very few terrorist groups would ever consider using biological weapons, and fewer still have the ability. It may wish to tell the public that the macroterrorist acts, which they have all come to fear, are the least likely to occur.

The American government may also wish to explain to the American public a bit about some of the programs created to reduce the threat of biological terrorism. It could tell them about the advanced identification and decontamination capabilities of the rapid response teams,⁵⁶ or the vast quantities of medicines available from the NPS. It could tell them about the investigative expertise of the FBI's HMRU, and explain to them the impressive capabilities of the Portal Shields.⁵⁷

Giving the public a greater understanding of the threat of biological terrorism would reduce some of the widespread fear of bioterrorism, thus greatly reducing vulnerability to hoaxes and extortive acts. Giving the public a better idea of their country's response assets will allow the people to better monitor and critique their government's counter-bioterrorism strategy, which would help eliminate overspending and the implementation of ineffective programs.

With all the benefits offered by educating the public on the threat of biological terrorism, we might think that the government would be eager to create such a program.

However, this may not be the case. Having a public ignorant both of the actual threat of biological terrorism and of their country's response assets has been quite profitable to many people and departments. A frightened public that is unaware that they already possess an extremely capable rapid response team will be more willing to pay for further costly response teams than a public that is aware of the minimal danger posed by bioterrorism and that knows about preexisting response teams. Agencies that stand to profit from keeping the American public in the dark will oppose education programs, perhaps on the basis that such programs could compromise national security by presenting sensitive information to the public. But, the counter-argument may go, how can a government withhold the truth from the people in good conscience, especially if a point is made of not giving out classified information?

Domestic Preventative Efforts

The United States should consider revising some aspects of its preventative strategy as well. Specifically, it should consider devoting more attention and funds to programs that would assist in the prevention of bioterrorist acts, introducing a licensing procedure for laboratories that use all varieties of pathogens, and minimizing the use of the Anti-terrorism Act in the prosecution of suspected bioterrorists.

The United States should consider reallocating funds from its counter-bioterrorism budget in favour of prevention. This does not mean that vast sums of money should simply be thrown at the FBI to use at their own discretion. Any extra funds devoted to preventative measures should go solely to well thought out programs, whose usefulness for the overall counter-bioterrorism strategy may be clearly discerned.

One such useful preventive program may be to add a licensing procedure to the CDC's framework of controls for dangerous pathogens.⁵⁸ Laboratories that intend to obtain and conduct research with even small amounts of pathogens that may be used as

biological weapons should be required to obtain a license from the federal government. The licensing procedure should be lengthy, complicated, and intrusive. Part of the application procedure should involve an inspection of the laboratory's facilities before the proposed research project begins, and an investigation into the education and criminal history of the involved scientists. However, in order to protect the intellectual property of the scientists, no further visitations would be required unless investigators detect something amiss with the activities of the laboratory.

This would be an improvement on the current system of transfer controls, which only require laboratories interested in receiving one of the deadly agents on the CDC's list to send a description of their containment facilities to the mail order house and be registered with the CDC.⁵⁹ No intrusive inspections are required.

In their applications, the laboratories should be required to give a brief description of the research to be conducted. They should only be allowed to obtain the biological agents listed in this proposal, and only in reasonable amounts. So that no laboratories neglect to follow the annoyingly complicated procedure, penalties for non-compliance for both senders and receivers of biological agents should be severe. However, even if the procedure is complicated, it should only deny licenses to laboratories whose applications display some irregularities or that lack adequate containment facilities. There should be no discrimination against types of research performed. All scientists, even those conducting vaccine research of dubious real value, should be allowed to obtain a license, provided they allow an inspection of their facilities and criminal histories. The point of these procedures is not to limit or direct microbiological research, but to give government inspectors access to research laboratories.

FBI agents working with CDC scientists should be responsible for monitoring license applications and the activities of suspicious applicants. Applicants who present false information on their applications, are known to be members of extremist groups, or

request toxins for medical reasons when they do not have medical training would be required, under the terms of the license, to submit to friendly visits from an FBI agent with a CDC microbiologist in tow. Naturally, it would take a lot of manpower to administer the licensing procedures, and especially to monitor suspicious applications, but this would be money well spent because this procedure would reduce the threat posed by all types of bioterrorism arising from domestic sources except hoaxes.

The complex and lengthy licensing procedure itself would be enough to deter impulsive terrorists or those groups with greatly impaired reasoning abilities from attempting to order biological agents from mail order houses and laboratories. The requirement for inspections would prevent many amateur terrorists without proper laboratory facilities and cults that do not appreciate the presence of outsiders from ordering biological weapons. The investigation of criminal pasts would deter experienced members of terrorist groups from ordering from legitimate laboratories and mail order houses. Of course, licensing cannot prevent terrorists from acquiring biological agents from natural or illegal sources,⁶⁰ but it removes one option for obtaining pure strains of biological agents from their grasp.

The United States could further improve its preventative strategy by revising a few of its existing preventative programs. For instance, no non-lethal agents, and no plant or animal pathogens are currently included in the CDC's list of agents subject to transfer controls.⁶¹ The United States should consider adding non-lethal and plant and animal agents to its list, and thus reduce the threat of non-lethal and agricultural terrorism arising from domestic sources. Again, requiring a license to obtain these agents is also an option. If the task of monitoring the movement of all of these agents is too much for the CDC, the transfer of plant and animal pathogens could be monitored by the USDA and/or the USGS, both of which are eager to participate in the United States' counter-bioterrorism strategy.⁶² Likewise, to prevent terrorists operating overseas from engaging in non-lethal terrorism,

the United States may also wish to include non-lethal agents on its list of substances subject to export control.

Licensing of and controls on more kinds of biological agents would likely be a source of endless headaches for legitimate researchers and pharmaceutical manufacturers within the United States. They will probably protest these constrictions quite vociferously, declaring that they needlessly complicate formerly straightforward ordering procedures. It remains to be seen, however, if their arguments are more powerful than those of their opponents who will undoubtedly cite the threat of biological terrorism as reason enough for inconveniencing scientists from all over the United States.

To reduce its vulnerability to extortive acts of biological terrorism, the United States may wish to imitate the Canadian approach in yet one more way. Recall that the United States has made the considerable error of creating a law, namely the Anti-terrorism and Effective Death Penalty Act of 1996, that makes any terrorist act planned or committed in the United States a federal crime,⁶³ while Canada has decided to continue prosecuting bioterrorists under preexisting laws in order to reduce the political impact of a bioterrorist act.⁶⁴ Any terrorists prosecuted under the Anti-terrorism Act will undoubtedly receive a great deal of media attention for their cause, which may have been one of their goals for the attack. To prevent terrorists from successfully seizing the media's attention in this way, the United States should continue to prosecute them for murder, arson, assault, and other apolitical crimes. The Anti-terrorism law should never be used. This is not to say that this law should be abolished, but just that it should be quietly set aside and not mentioned or used for a very long time.

International Efforts

Improvements to the international arm of the American counter-bioterrorism strategy would likely occur after it becomes apparent to the United States that it is less threatened

by international terrorist than by domestic ones. These improvements would ideally include reducing the American commitment to collaborative research programs in Russia, and a revision of the United States' export control and sanctioning policy. Other changes to the international strategy might include pressuring the Australia Group to establish controls on the export of non-lethal pathogens.

A potential result of the assessment of the bioterrorist threat called for earlier may be a realization that, contrary to present popular opinion, the threat of bioterrorism arising from international sources is really quite minimal. Few international terrorist groups such as Hamas and Hizbollah are likely to use biological weapons, and the twin threats of state sponsored terrorism and terrorist groups assisted by underemployed Russian microbiologists are routinely overstated. When these facts come to light, the United States may decide to revise its policies meant to reduce the threat of international biological terrorism. For example, if the assessment reveals that it is extremely improbable that Russian scientists will assist terrorist groups,⁶⁵ the United States may rightly decide not to increase payments to collaborative research programs. Likewise, when the United States realizes that it is unlikely that any of the states upon which it has imposed sanctions are actually sponsors of biological terrorism,⁶⁶ it may reconsider its extensive sanctioning policy.

However, we should not expect these sanctions to be lifted. Even if the United States is forced to acknowledge to itself that there is virtually no evidence that either Sudan, Iraq, North Korea, Syria, or Cuba are state sponsors of terrorism,⁶⁷ in all likelihood the sanctions imposed on these countries will not be lifted for this reason alone. Most of the states listed above have been subjected to sanctions for a number of reasons, only one of which is their suspected complicity with terrorists. Furthermore, acknowledging that they were wrong to accuse these states of sponsoring terrorism and then lifting all sanctions would cause the United States to lose face to these openly defiant states.

Cancelling sanctions would show these rogue states that they are capable of enduring American sanctions due to their superior will and the rightness of their cause. This will only encourage them and other potential aggressors to continue to defy the United States. This is obviously not in the best interests of the United States, and, fairly or not, these sanctions will probably remain intact for many years. In the unlikely event that these states discontinue their general insubordination, the United States may indeed remove these unfair sanctions. However, given the long-standing economic insignificance of trade with any of these states,⁶⁸ the United States is in no hurry to do so.

Like many countries, the United States has placed a great deal of faith in the ability of the United Nations and the BTWC to reduce the threat posed by international stocks of biological weapons.⁶⁹ As suggested in the last chapter this faith may be misplaced. This is not to suggest that the United States should discontinue its efforts in international organizations - it does cost very little to participate in the United Nations, and if nothing else such participation has allowed the United States to broadcast its abhorrence of biological weapons usage to the world - but the United States should be aware that the UN and the BTWC, with a verification regime or not, may not be capable of accomplishing all that is hoped for.

To prevent international terrorists from obtaining non-lethal pathogens, The United States should push the Australia Group to consider controlling the transfer of certain non-lethal agents that might be used in bioterrorist attacks. The Australia Group already has a warning list of less dangerous agents whose transfer is monitored but not controlled.⁷⁰ Perhaps non-lethal agents should be added to this list.

To improve its counter-bioterrorism strategy, the United States has a long and arduous road ahead of it that begins with assessing the threat of biological terrorism and creating a cost-saving plan. Numerous other changes, some of which involve imitating Canada's approach to the same problems, some that involve defying influential agencies,

should also be made in order to vastly improve what is now a disordered mess. However, these changes are all possible, provided someone has the will to carry them out.

Possible Improvements to Canada's Counter-Bioterrorism Strategy

Canada should make a few alterations to its current counter-bioterrorism policies as well. Although there are fewer recommended changes for Canadian government to make, this is not a reflection of the superiority of the Canadian plans. Rather, it is just due to the smaller number of programs that the Canadian government has implemented to combat biological terrorism. Fewer programs require fewer changes.

Although numerous American scholars have published advice, some of dubious value, as to how the American response to the bioterrorist threat might be improved, the same cannot be said of Canadian experts. Indeed, Canada's response to the bioterrorist threat has captured the interest of Canadian scholars about as effectively as the threat of biological terrorism. This should not be allowed to continue. Without constructive criticism from informed individuals outside of government, the faults of Canada's counter-bioterrorist strategy may go unnoticed until they are actually put to the test during a bioterrorist event. In the absence of suggestions offered by other scholarly works, we will be forced to rely on the advice offered by interviewees working for various government agencies and the power of our own minds to invent improvements to Canada's strategy.

Canada must consider making a few fundamental changes to its counter-bioterrorism strategy. By focussing exclusively on dual-use programs, Canada has created an inexpensive strategy to combat this emerging threat, but by not implementing Delta programs with no application besides combating bioterrorism, Canada has left a few important gaps in an otherwise well-organized and commendable strategy. Specifically, by ignoring the Delta Canada has left itself unprepared for macroterrorist attacks.

Nor would the Canadian government apologize for not adequately combating the

macroterrorist threat.⁷¹ It is, after all, the least likely type of bioterrorist attack to occur. Surely, there are better ways to spend Canada's meagre defence dollars, or so the argument goes. And yet the possibility that Canada will fall victim to a macroterrorist attack remains. Canada has as many cults as any other free society,⁷² and there is a possibility that one of these groups will show interest in using biological weapons to bring about the Apocalypse. There is an off chance that other types of terrorists might also experiment with the deadliest types of biological agents.

Computer modelling simulations indicate that it is possible for terrorists to infect over 20% of the population of a large Canadian city with a single long line source release of anthrax.⁷³ Measures can be taken to reduce the damage caused by such an attack, but the prevailing attitude towards this threat is one of resignation. No matter what we do, the government reasons, such an attack will inevitably create strife for hundreds if not thousands of Canadians.⁷⁴ This attitude cannot be allowed to persist. As the American response has shown there is much that can be done to reduce the damage created by a macroterrorist attack, and not all of these programs require significant additional expenditures. Canada should consider adapting some of these American-style programs to its own situation in order to reduce the threat posed by all types of biological terrorism, but especially macroterrorism.

Unfortunately for the parsimonious Canadian government, many of these preparations would involve the expenditure of a great deal of money on programs without an obvious dual use. It may prove difficult to garner support from government and the public in general for expensive Delta programs that combat a low-probability threat. This alone may make implementing programs to combat macroterrorism quite infeasible. When discussing proposed changes to Canada's counter-bioterrorism strategy this financial reality should always be at the forefront of our considerations.

As with the suggestions for improvement to the American counter-bioterrorist

strategy, recommendations for improvement to the Canadian strategy will be divided proposed changes to domestic consequence mitigation programs, preventative efforts, and international efforts.

Domestic Consequence Mitigation Efforts

In order to minimize the effects of a bioterrorist attack Canada needs to make a number of improvements to its consequence mitigation strategy, many of which involve emulating the American response to the bioterrorist threat. Some of these improvements, including the expansion of the NBCRT, the establishment of medical response teams, the expansion of Health Canada's recent initiative to train ER doctors to recognize the signs of a bioterrorist attack, more frequent training exercises, and the revision the contents of Canada's limited stockpiles to include vaccine-producing materials, would necessarily require additional expenditures. However, a mechanism exists whereby the cost of many of these programs could be shared with the provincial and territorial governments. Other improvements would not require significant expenditures. These inexpensive improvements would include the development of a quarantine policy, the increased involvement of the agencies responsible for plant and animal health, the acquisition of a CIBADS units, and the development of a device capable of detecting and identifying pathogens in solid or liquid form.

The first of many expensive American-style changes that the Canadian government should consider making is to increase the size of its rapid response team. Rapid response teams are extremely useful for responding to a wide variety of biological terrorist incidents, but especially macroterrorist attacks. Rapid response teams are trained to operate in Level A containment suits. They have some capacity to identify biological agents. They can assist local first responders with triage, planning, and decontamination.⁷⁵ Rapid response units are also ideally suited to enforcing quarantines, since they are well trained to

recognize potential hazards. However, Canada has but one such team on which to rely during a bioterrorist incident.⁷⁶ It is doubtful that one team would be able to provide as much assistance as is hoped for during a large scale attack, let alone enforce a quarantine. Therefore, the Canadian Armed Forces should consider expanding the size of the NBCRT.

Like its American counterparts, the NBCRT would take approximately four hours to arrive at the site of a bioterrorist attack. For reasons outlined in the last chapter, this delay is unacceptable. To correct this failing, the Canadian military should station NBCRT units at more than one base in Canada. Instead of just being based at Borden,⁷⁷ NBCRT units should be placed at bases throughout Canada, and especially at bases closest to the cities most threatened by bioterrorism. The exact placement of these teams may be left to the discretion of military logisticians, but perhaps one team might be assigned to Canada's west coast, in order to handle chemical and biological incidents in western Canada, one team could be placed on the east coast to respond to incidents in the Maritimes and eastern Quebec, and one left in Borden to handle emergencies in central Canada,

If the Canadian government is reluctant to pay for the training and equipment needed to produce a larger NBCRT, the proponents of such a plan could justify the expenditure by explaining how useful a large NBCRT team could be to Canada's international peacekeeping efforts, thus showing that the NBCRT has a dual use. Canada's peacekeepers are regularly deployed to places where there is a greater chance of biological weapons usage than in Canada.⁷⁸ Soldiers trained to operate during biological incidents would be invaluable to an international peacekeeping force.

However, if the government is still unwilling to pay for a larger NBCRT, it may be acceptable to settle for training more of Canada's soldiers to better respond to domestic bioterrorist incidents.

At present, specialized CB defence training is provided each year for the Advanced NBC Defence Officer Course (AB Course), the Land Forces

Technical Staff Course (LFTSC), and the NBC Response Team (NBCRT). Training has also been given to CF troops prior to deployment as peacekeepers.⁷⁹

But, perhaps some training in responding to biological events should be given to as many people in the Canadian military as possible. Even if they do not become specialists in handling hazardous biological materials, everyday soldiers could be trained to enforce quarantines, decontaminate affected areas, recognize the symptoms of a biological attack (if not identify specific agents), operate in full protective gear, and assist with administering prophylaxis and antibiotics. The Canadian military prides itself on the high quality and diversity of training and education that its soldiers receive. Why not further this reputation by developing a generalized CB defence course?

Another American counter-bioterrorism initiative that Canada should consider emulating is the establishment of the medical response teams. These teams, composed of local nurses, EMTs, and doctors specially trained to respond to bioterrorist incidents and armed with a large stockpile of pharmaceuticals and equipment, are intended to provide assistance to overwhelmed hospitals in the event of a bioterrorist attack. Unlike rapid response teams, they can respond quickly to an attack because they are locals.⁸⁰ These teams would be useful for responding to a great variety of bioterrorist events, including macroterrorist incidents, as well as other more generalized major medical emergencies such as earthquakes, floods, and 'flu epidemics. Since these teams may be useful in other situations besides bioterrorist attacks, it may be possible to convince the Canadian government to implement a variation of the American medical response teams.

Like local Search and Rescue Teams and disaster response organizations, these groups would ideally be composed of local volunteers, however it may be necessary to pay overworked medical staff to attend any training sessions offered.⁸¹ After attending training sessions, these teams would be on-call, and should be available to respond to possible bioterrorist incidents within a few hours. It would be difficult to justify spending on

pharmaceutical stockpiles for these groups, but as long as they have access to Canada's existing stockpiles of medical supplies this should not be a problem.

Additionally, Canada's recent initiative to train ER doctors to recognize the victims of an anthrax attack⁸² could be expanded to include information about a number of other potential agents. Although anthrax would be an ideal component of many varieties of biological attack, there are many other possible pathogens. A campaign could be launched to train ER doctors, family practitioners, EMTs, and other medical personnel who might be the first to come in contact with the victims of a biological attack to recognize and properly treat the victims, as well as alert public health authorities to the possibility of a bioterrorist incident.

Another American initiative that Canada may wish to emulate is grants given to local authorities for the purchase of equipment. Currently, provincial and municipal governments would be responsible for paying for any decontamination, identification, or protective equipment that first responders might use in bioterrorist incidents.⁸³ Perhaps the federal government should pay for some of this equipment. In the long run, it would probably be cheaper for the federal government to pay for equipment grants than for the extensive disaster relief effort that would be necessary after a poorly handled response to a bioterrorist incident.

Yet another expensive but worthwhile Delta initiative is more exercises for the agencies involved in responding to bioterrorist incidents. Currently, the NBCRT has a yearly national field exercise,⁸⁴ but other agencies involved in counter-bioterrorism do not hold nearly as many exercises as their American counterparts.⁸⁵ This is unfortunate because exercises are ideally suited to pointing out deficiencies in a state's consequence mitigation efforts. However, exercises are extremely expensive. To reduce costs Canada could rely less on the outrageously expensive field exercises that the United States favours, and more on relatively inexpensive tabletop exercises.

As has been recommended for the United States, Canada should consider altering the contents of its medical stockpiles to include products and materials useful in the production of vaccines. Commendably, Canada's limited stockpiles do not focus on treatments for any specific diseases but instead include such general-purpose items as beds and antibiotics.⁸⁶ But, because prophylaxis administered immediately after infection is the single most effective way to reduce losses created in a bioterrorist attack,⁸⁷ Canada should look into increasing its vaccine producing capacity. Again, growth culture, incubators, and 'bubble' supplies of chicken eggs might be included in Canada's stockpiles.⁸⁸ The useful roles these items would also play during 'flu outbreaks could be cited as justification for the cost of these additions.

All of the above proposed changes will be expensive to implement, and the Canadian government will probably balk at paying for any of them. Nevertheless, there exists a program that would allow the federal government to share the costs for these initiatives with the provincial and territorial governments. This is the Joint Emergency Preparedness Program (JEPP) of 1980. The JEPP was implemented in order to

encourage cooperation between the federal government and the provincial/territorial governments in working toward an enhanced national capability to meet emergencies of all types with a reasonably uniform standard of emergency services across the country.⁸⁹

The JEPP is a cost-sharing initiative through which the

federal government, in consultation and in cooperation with the provincial and territorial governments, undertakes or contributes to projects that enhance the national emergency response capability.⁹⁰

To be eligible for funding under the JEPP, a project must clearly enhance national and provincial emergency response capabilities, include both federal and provincial/territorial

commitments, and be approved by both the provincial minister responsible for emergency preparedness and the Executive Director for Emergency Preparedness Canada. Any of the above proposed projects except possibly the expanded NBCRT might be funded by this program. Even the first responder training offered by DRES, for which no level of government has so far taken financial responsibility,⁹¹ might be paid for through the JEPP. This could greatly reduce the federal government's financial commitment to combating bioterrorism (albeit at the expense of the provinces and territories).

However, until now the federal government has only allocated about \$4.5 million CDN to the JEPP per year.⁹² Even if the provincial and territorial governments were to match the federal government's commitment to these projects dollar for dollar, only \$9 million worth of projects may be funded through the JEPP per year. If any of the above projects are to be funded through the JEPP, both levels of government will have to increase their commitment to the JEPP. If the federal government wishes to implement any of the above proposed projects, an increase the counter-bioterrorism strategy's budget seems inevitable.

Not all improvements to Canada's consequence management strategy would require an additional outlay of cash. A few inexpensive changes to the counter-bioterrorist strategy may increase Canada's ability to respond to all forms of biological terrorism, including macroterrorism. For instance, formulating a quarantine policy, in secret or not, would not require a great deal of funds to be diverted to counter-bioterrorism efforts. Developing a quarantine policy would offer Canada the same benefits as the United States, such as an increased ability to mitigate the consequences of a macroterrorist attack, and involve a similar range of issues. Again, the sooner such a policy is created, the better.

Still another way for Canada to learn from the example set by the Americans would be to include government departments involved in agriculture and the health of wildlife in counter-bioterrorism preparations.⁹³ The agencies that monitor the health of Canada's wild

and domestic flora and fauna would probably be the first agencies to realize that an act of agro-terrorism has taken place or that a zoonosis has been released.⁹⁴ The input of Agriculture Canada, Natural Resources Canada, and the provincial natural resources services should therefore be sought during future counter-bioterrorism planning sessions, and these departments should be given clear lines of communication with public health laboratories. It took an outbreak of a deadly exotic disease for the Americans to learn that the USDA and USGS should be included in the counter-bioterrorism strategy;⁹⁵ let us hope that Canada can see the merit of involving these departments' counterparts without also falling victim to such a disaster.

Canada should look into the possibility of acquiring at least one CIBADS unit for domestic use. A CIBADS unit would be able to monitor the atmosphere for unusual airborne pathogens. Thus, it is suited to reducing the threat posed by all kinds of bioterrorist attacks that might involve aerosolized agents. If more than one unit is procured they can be installed in centralized areas of the Canadian cities most threatened by biological terrorism, such as Ottawa, Toronto, Montreal, Vancouver, Halifax, and Windsor.⁹⁶ If just one unit is purchased it can be moved from city to city in order to provide protection for high profile events, such as the various international summits that periodically occur in many of Canada's larger cities.⁹⁷ If a covert biological event is suspected to have occurred, the CIBADS unit may be quickly deployed to the affected area in order to identify the offending pathogens.

Acquiring a CIBADS unit does not have to cost a lot of money either. Since the Canadian government underwrote the development of the CIBADS system, a deal may be made with Computing Devices of Canada to lease a unit for a discounted rate. After all, what better free advertising could Computing Devices of Canada ask for than the endorsement of the Canadian government for their detection system?

Having perfected an airborne pathogen detector,⁹⁸ Canada's defence research

establishments should now turn their attention towards developing an instrument capable of identifying agents spread on solid surfaces, such as foodstuffs, or dissolved in liquids. As mentioned several times before, biological pathogens are much more likely to be disseminated in solids or liquids than by aerosol means. Perhaps some variety of fast-acting hand-held mass spectrometer is in order.

This study does not recommend budget increases Canada's defence research establishment. The reasons for this omission are as follows: Despite its small budget, DRES has had many promising results from its research and development projects.⁹⁹

Paradoxically, the United States with its huge R&D budget has had much poorer results. A small budget forces a research establishment to prioritize and choose only the most promising projects on which to concentrate their efforts. No such budgeting is necessary for a research establishment with virtually unlimited resources. They can finance all kinds of projects, even those that are less promising or that have faulty premises. Research establishments with larger budgets may also be tempted to all manner of gee-whiz technology to their products instead of concentrating on the basic principles behind their projects. The bottom line is that DRES, with its smaller budget, has proven that it can produce extremely promising results with very little funding, and there is little reason to expect it will not continue to do so.

Nor does this study recommend that the Canadian government should educate its citizens about the threat of biological terrorism and Canada's response capabilities. Recall that this education program was recommended in order to alleviate the widespread fear of biological terrorism in the United States engendered by earlier, more sensational television appearances. No such fear exists in Canada, so no such corrective action is necessary. This is not to suggest that the government should advocate a policy of forced ignorance, but why waste money on programs that fix what is not broken? Indeed, government officials suddenly appearing on television and telling Canada to remain calm and that there is

nothing to be worried about might persuade Canadians that there is indeed something amiss, and that they should be afraid of biological terrorism. Should the fear of biological terrorism that currently troubles so many Americans ever drift north, such education may indeed be called for, but there is no need for such corrective actions in Canada so far.

Domestic Preventative Efforts

There are fewer suggested improvements to Canada's preventative strategy than there were for the American strategy, largely because Canada already gives adequate attention to preventative programs, and because it has not made the mistake of introducing a harsh anti-terrorist law. Therefore, our suggestions for improvement to the Canadian preventative strategy are limited to a recommendation that Canada should also introduce a complex licensing procedure and more stringent controls on the domestic transfer of dangerous pathogens.

Like the United States, Canada should look into the possibility of making the acquisition of dangerous pathogens by domestic terrorists more difficult by creating an elaborate system of controls and licenses, more or less along the lines of the regulatory framework created by the CDC and the proposed licensing procedure mentioned above. As they would in the American system, these regulations make it difficult for domestic terrorists to acquire pathogens from laboratories and mail order houses, thereby reducing the threat posed by all kinds of bioterrorism. As recommended for the United States, Canada should consider controlling the domestic transfer of non-lethal pathogens and, more importantly given Canada's greater vulnerability to agricultural terrorism, plant and animal pathogens.

International Efforts

Because Canada does not have a controversial sanctioning and export control policy, nor

any collaborative research programs of dubious utility, there are fewer recommended changes to Canada's international strategy. These suggestions are limited to persuading the Australia Group to control the export of non-lethal pathogens, and recognizing that the UN and other international organizations may not be effective at significantly reducing the bioterrorist threat.

Like the United States, Canada should persuade the Australia Group to expand its list of controlled agents to include non-lethal pathogens. Exporting these ubiquitous pathogens does not have to be prohibited, but suspicious requests for these agents should be monitored.

Even more so than the United States, Canada has placed a lot of faith in the ability of the G-7, the UN, and especially the BTWC to reduce the threat of biological terrorism. Canada has involved itself in virtually every international effort to reduce the twin threats of biological weapons and terrorism,¹⁰⁰ and has even gone so far as to declare that "Terrorism is a global phenomenon, and the struggle against it must therefore be carried to the world stage."¹⁰¹ Although the threat of terrorism in general may indeed be a global problem, the threat of biological terrorism, as was shown in the first chapter, is overwhelmingly a domestic problem. Canada must never assume that biological terrorism is primarily a global problem, nor that it can be effectively dealt with on the world stage. As we have seen from the persistent difficulties involved with strengthening the BTWC, the world community has had and will continue to have a very tough time dealing with the threat of biological terrorism.¹⁰² This is not to suggest that Canada should discontinue its efforts in the UN and G-7; if nothing else these organizations have allowed Canada to transmit its low opinion of biological weapons to the entire world, but Canada should never rely exclusively or even primarily on international organizations for defence against biological terrorism.

To be better prepared to meet the bioterrorist threat, and especially the

macroterrorist threat, Canada needs to make several changes to its counter-bioterrorism strategy, many of which are inspired by American efforts to combat the same threat. Unfortunately, most of these changes require the outlay of a great deal of cash, and that is one resource that Canada, unlike the United States, may be unwilling to devote to its counter-bioterrorism strategy. The proponents of any of these strategies should try to find dual uses for these suggested programs, which might be used to persuade the Canadian government that these initiatives are cost-effective and worthwhile. Otherwise, despite having a well-organized and elegant counter-bioterrorism strategy, Canada may be unprepared to meet the most dangerous type of biological terrorism of all.

Concluding Remarks

In our quest to determine which country, Canada or the United States, has developed the most appropriate response to the bioterrorist threat, we have made some interesting discoveries and observations. Among the first observations made by this paper was that the threat of bioterrorism is multifaceted, that there are many different kinds of possible bioterrorist attacks, such as hoaxes, murder, product tampering, agricultural terrorism, small-scale attacks, non-lethal acts, and macroterrorism. Incidents belonging to any of these categories are usually united by common technical and motivational constraints, as well as common measures of success. Furthermore, it was postulated that due to their differing abilities to surmount technical and motivational obstacles, different types of terrorist groups will gravitate towards different types of biological terrorism. The comparative threat of biological terrorism to a particular country could therefore be measured by ascertaining which terrorist groups would logically be attracted to which kinds of biological terrorism, and then observing which of these groups are a threat to Canada and the United States.

Of course, certain characteristics possessed by the target state can also affect the

likelihood of a bioterrorist attack and the damage such an attack would do. If a list of traits likely to affect a state's vulnerability is created, and if we consider whether Canada and the United States possess any of these qualities, we may further gauge the comparative probability and potential destructiveness of the various types of biological terrorism.

Using these techniques we have been able to ascertain that the threat of biological terrorism is much greater to the United States than it is to Canada, both because it is threatened by more terrorist groups who might consider using biological weapons, and because it possesses certain qualities that make it more vulnerable to bioterrorist attack. The most likely bioterrorist acts to occur in the United States, or anywhere for that matter, are hoaxes, which have almost no motivational or technical constraints and are therefore within the capabilities of virtually all terrorist groups. Murder and product tampering, which are similarly quite easy to perpetrate, are the next most likely events to occur.

The threat to Canada is much smaller. There are fewer terrorist groups who might wish to harm Canada or Canadians, and Canada is less vulnerable to all types of biological terrorism except agricultural terrorism. Indeed, due to our greater reliance on agriculture and the particularly virulent environmental terrorists that have targeted Canadian industries, Canada has much more reason to fear agricultural terrorism than the United States. However, hoaxes and murder are again the most likely acts to occur. Macroterrorism, the kind of biological terrorism most feared by the general public and the kind most discussed by politicians and novelists, is the least likely form of bioterrorism to occur in either country.

However, the possibility remains that terrorists may attempt to perpetrate such an attack. Even if it would be more logical for them to try their hand at an attack that requires less technical skill, and even though bringing about the deaths of thousands of people would hardly advance the causes of the vast majority of terrorist groups, some terrorist groups may still attempt a macroterrorist attack.

As has been stated repeatedly, terrorists have hardly proven themselves to be logical and reasonable people. Using violence or threats of violence to achieve political, religious, or ideological ends is an ineffective means for subnational actors to achieve anything.¹⁰³ Knowing this, we must doubt the capacity for reason of anyone who chooses to use these means, including attacks using biological weapons, to accomplish their ends.

If terrorists are unreasonable we may be occasionally incapable of correctly predicting their actions, if we base our predictions on what is the most reasonable course of action for terrorist groups to follow. If terrorists' actions are periodically unpredictable, the safest response to the threat of terrorism is a broad band one,¹⁰⁴ which attempts to combat as many kinds of bioterrorism as possible, including macroterrorism.

As we saw during our discussions of both countries' three-pronged counter-bioterrorism strategies, neither country has formulated a response that adequately combats all seven types of bioterrorism. Canada is currently unprepared to combat agricultural terrorism, murder, and, most alarmingly, macroterrorism. The United States focuses too intently on combating the threat of macroterrorism, while ignoring the threats of murder, non-lethal terrorism, and hoaxes.¹⁰⁵

Furthermore, our examination of both states' counter-bioterrorism strategies has revealed that the American response is poorly organized, with an over-abundance of Delta-type programs such as rapid response teams, and insufficient attention devoted to such vital aspects of the counter-bioterrorist strategy as disease surveillance and long term patient care.¹⁰⁶ The American system may also be criticized for focussing too intently on consequence management at the expense of preventative measures, and on programs designed to combat the minimal threat of bioterrorism arising from international sources.

As a result of a desire to minimize costs by maximizing existing capabilities,¹⁰⁷ Canada's response to the bioterrorist threat was shown to be significantly better organized. This desire has also led to a preponderance of dual-use programs. Even though it is well-

organized and inexpensive, Canada's response to this threat is far from perfect. Many issues still have to be resolved regarding Canada's burgeoning counter-bioterrorism strategy. For instance, Canada still needs to develop a quarantine strategy, and decide how the first-responder training offered by DRES should be financed. Furthermore, the wisdom of the decision to not prepare for macroterrorism is questionable.

The failings of both states' counter-bioterrorism strategies may be corrected with the implementation of the proposals discussed above. Many of the suggested improvements to the American strategy were inspired by Canada's response to the same threat, and many of the suggested improvements to Canada's strategy were likewise inspired by the United States' counter-bioterrorism programs. It was recommended that the United States should pare down some of its ill-conceived and superfluous programs, and introduce a few new programs to correct some of the failings discussed in the second chapter, in the process risking the wrath of some important government departments.

The suggested improvements to Canada's strategy mostly involve increasing Canada's capacity to combat the threat of macroterrorism by adopting more American-inspired or Delta-style programs, most of which, it should be noted, would also help combat other types of bioterrorism. The majority of these proposed programs would require an additional outlay of money, which the Canadian government and Canadians in general may be unwilling to divert to counter-bioterrorism. Proponents of these programs should try to come up with dual-uses for any of these proposed plans in order to make them more palatable to Canadian tax-payers.

Other improvements to the counter-bioterrorist strategy may also benefit Canada's response without necessarily involving the diversion of funds to the counter-bioterrorism strategy. For example, involving Agriculture Canada and federal and provincial natural resource authorities in future counter-bioterrorism planning sessions would improve Canada's ability to combat agricultural terrorism without requiring additional expenditures.

But which strategy, to answer the question posed at the beginning of this paper, is best suited to combating the threat of biological terrorism as present in each state? This is extremely difficult to determine: both strategies have their strong points and their failings. Neither is perfectly suited to combating the threat of bioterrorism, and neither is clearly better than the other.

It might have been easier to decide which response is better had we compared the counter-bioterrorism strategies of two states that are equally threatened by and vulnerable to the same kind of bioterrorist attack. For this reason, in the course of future research it may be profitable to compare the counter-bioterrorism strategies of the United States and France, which is at greater risk of bioterrorist attack than Canada.¹⁰⁸ Such a comparison may reveal other shortcomings of the American response, as well as suggest further potential improvements.

The Canadian response has been much more modest than the American approach, but Canada is threatened by fewer potential bioterrorists and is generally less vulnerable. The American preparations are far more extensive, and it is arguably always better to be overprepared than underprepared.¹⁰⁹ However, we are not attempting to determine which country is better prepared, but which response is most appropriate to each state's situation. It may be the case that no bioterrorist event will ever occur in the United States, and therefore, that it has wasted entirely too many resources combating this threat. Evidently, it is indeed very "difficult to get a balance between how significant a threat is and how we have to respond."¹¹⁰

The crux of the matter lies in the fact that we can never know for certain how significant the threat is to Canada or the United States, because we cannot observe all of the thoughts and activities of all of the terrorists threatening Canada and the United States. Certainly, we can make a good show of predicting their likely behaviour, by referring to relative vulnerabilities and the likelihood that certain types of terrorists groups will

logically gravitate towards certain types of bioterrorism, but we can never know for certain whether our predictions are correct unless an actual bioterrorist event occurs and confirms or denies our suspicions. We will always run the risk of underestimating or overestimating any threats associated with secretive and irrational groups like terrorists. If we cannot know for sure which events will happen and when (if ever), we cannot conclusively determine whether a costly and extensive is warranted, or if minimal preparations are all that is necessary.

Since neither response is above reproach, and since we can never be sure whether either state has achieved the elusive balance between threat and response, we must issue the equivocal and unsatisfactory conclusion that this method of comparing responses has indicated that neither response is more appropriate than the other. Nothing would have been more gratifying than to have concluded that one country's response is clearly superior to the other's, and to attack the inferior strategy with all manner of harsh criticism. But, sadly, this is not to be the case. Maybe a comparison with France will reveal the American response to be a clearly inferior strategy, but according to this research method, neither Canada's nor the United States' response to the threat of bioterrorism is inherently better than the other.

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Appendix I – Selected Pathogens That Might be Used in a Bioterrorist Attack

Agent	Scientific name	Signs and Symptoms	Mortality rate	Transmittability	Stability	Natural sources	Treatment
Bacteria Anthrax	<i>Bacillus anthracis</i>	Incubation of 1-6 days. Illness lasts 1-2 days. Fever and fatigue followed by abrupt onset of severe respiratory problems, shock, pneumonia, and death within 2 to 3 days	Very high when inhaled or injected	No	Very. Lasts for decades in spore form. Resistant to heat, sunlight, and disinfectants	Corpses of animals that died of anthrax, soil where anthrax is enzootic	Vaccine available (some strains resistant) Treatable if antibiotics are administered before onset of symptoms
Brucellosis	<i>Brucella melitensis</i> , <i>B. suis</i>	Incubation 5-60 days. Fever, headache, depression, fatigue, aching joints, and some gastrointestinal symptoms	2-5%	Not usually	Not very	Unpasteurized milk and cheese from infected animals	No vaccine. Treatable with antibiotics
Glanders	<i>Burkholderia mallei</i>	Incubation of up to 10-14 days after inhalation. Fever, myalgia (muscle pain), headache, pleuritic chest pain, splenomegaly, papular eruptions, cervical adenopathy (enlargement of lymph nodes)	Without treatment always fatal	Low person-to-person, and animal-to-person	Not viable outside of animal hosts	Infected horses and donkeys.	No vaccine or dependable treatment
Plague	<i>Yersinia pestis</i>	Incubation of 2-3 days. Malaise, fever, tender lymph nodes (buboes), skin lesions,	In pneumonic form, always fatal.	Yes, very	Can live for years at near freezing	Buried bodies, fleas.	Vaccine available. Treatable with antibiotics if admini-

		respiratory and circulatory failure, death	50% in bubonic form		temperatures, but is killed by heat and sunlight. Lives in dried sputum, flea feces, buried bodies		stered within 24 hrs of onset of symptoms
Tular-emia	<i>Francisella tularensis</i>	1-10 day incubation. Fever, headaches, malaise, cough, weight loss	5-35 % depending on route of infection	Not very	Lives for weeks in water, soil, carcasses, hides, frozen rabbit meat. Killed by heat and disinfectants	Infected deerflies, mosquitoes, ticks, contaminated food, water, rabbit meat	Vaccine available. Treatable with antibiotics if administered early
Q Fever	<i>Coxiella burnetii</i> (rickettsia)	2-14 day incubation. Cough, aches, fever, chest pain, pneumonia. Not usually a critical illness	1%, but highly infectious	Not very	Not very	Sheep, cattle, goats (esp. in placental tissues, milk, urine, feces)	Vaccine available. Extensive treatment not usually necessary
<i>Viruses</i> Small-pox	Variola major virus	Average incubation of 12 days. Illness lasts several weeks. Malaise, fever, rigors, vomiting,	35%	Very	Stable for a virus. Lives on cont-	CDC and Ivanovsky Institute in Russia are supposed to have	Limited amounts of vaccine available

		headache, lesions, pustular vesicles, death			aminated blankets for a few days	only remaining samples of smallpox virus	
VEE	Venezuelan Equine Encephalitis virus	Incubation 1-5 days. Fever, severe headache, myalgia, nausea, cough, vomiting diarrhea, sore throat	20% in children. 1% in adults	Possibly	Easily killed by heat and disinfectants	Infected horses and donkeys	Vaccine available. No specific therapy available
Viral Hemorrhagic Fevers (Ebola, Marburg, Lassa, hantavirus, Rift Valley fever, Yellow fever, Dengue	<i>Filoviridae</i> , <i>Arenaviridae</i> , <i>Bunyaviridae</i> , <i>Flaviviridae</i> , etc.	Fever, easy bleeding, hypotension, shock, flushing of face and chest, edema, headache vomiting, diarrhea, death	5-90% depending on agent	Mostly through secretions.	Depends on agent	Very rare. Maybe from monkeys, mice	Vaccine available only for Yellow fever. Requires intensive supportive care. Antiviral therapy with ribavirin a possibility
Toxins Botulinum	Produced by <i>Clostridium botulinum</i> bacteria	Takes effect within 24 hrs. Illness lasts 24 - 72 hrs. Weakness, dizziness, dry mouth, blurred vision, muscle weakness, paralysis, abrupt respiratory failure, death	65%. Lethal dose 0.001 micrograms per kilo of body weight	no	Denatures within 12 hrs	Improperly canned foods	Vaccine and antitoxin available
Staphylococcal Ent-	Produced by <i>Staphylococcal</i>	Takes effect within 3 - 12 hrs. Illness lasts up to 4 weeks. Fever,	More of an incapacitating	no	Resistant to heat	Improperly handled food	No vaccine or specific therapy

ero-toxin B (SEB)	<i>aureus</i> bacteria	chills, headache, nausea, cough, diarrhea, vomiting, septic shock, death	illness				available
Ricin	Found in <i>Ricinus communis</i> (castor beans)	Takes effect within a few hours. Illness lasts 3 days. Rapid onset of weakness, fever, cough, fluid in lungs, respiratory distress, death from hypoxemia	Depends on route of exposure. Lethal dose 3-5 micrograms per kilo of body weight	no	Resistant to drying and heat	Castor beans	No vaccine or antitoxin available
Tricothecene Myco-toxin	Produced by <i>Fusarium</i> , <i>Myrotilium</i> , <i>Trichoderma</i> , <i>Stachybotrys</i> fungi.	Skin pain, redness, necrosis and sloughing of epidermis, nose and throat pain, itchy nose, sneezing, wheezing, chest pain, hemoptysis (spitting blood), prostration, weakness, ataxia, collapse, shock, death	Lethal dose 1,210 micrograms per kilo of body weight	no	Extremely resistant to heat and light	Fungi, possible source of 'yellow rain'	No specific vaccine or treatment available

(Source: United States of America, United States Army Medical Research Institute of Infectious Diseases, Medical Management of Biological Casualties Handbook, ed. Edward Eitzen, *et al.* (Fort Detrick, Maryland, 1999), 9-74.

Appendix II – Technical and Motivational Constraints Associated With Each Type of Bioterrorism, and the Terrorist Groups Who Would Therefore be Capable of Perpetrating Such an Act

Type of Act	Technical barriers	Motivational barriers	Types of terrorist groups who might perpetrate this kind of act
Hoax	None	None	All except some cults
Murder & assassination	Minimal	Minimal	All except possibly single issue terrorists
Small scale attack	Overcome using simple but innovative methods	Significant	All except single issue terrorists and cults interested in bringing about an apocalypse.
Product tampering	Slightly more difficult than murder	Moderate	Animal rights groups, environmental terrorists, right wing terrorists, mentally ill individuals, international terrorist groups, possibly terrorists with religious motivations.
Agro-terrorism	Overcome using specialized knowledge and innovative dissemination	Minimal	Religious and millenarian groups, international terrorists, environmental terrorists, right wing terrorists, possibly animal rights groups
Non-lethal	Depends on type of act planned	Minimal	Any except possibly single issue groups
Macroterrorism	Almost impossible to surmount	Almost impossible to surmount	Large cults with an apocalyptic vision.

Appendix III – Types of Terrorist Groups and Which State (US or Canada) is More Threatened by These Groups

Type of terrorist group	Which state is more threatened
Anti-abortion terrorists	United States
Animal rights terrorists	United States
Environmental terrorists	Canada
International terrorists (some with religious motivation)	United States
Right wing extremists	United States
Apocalyptic cults	Both
Mentally ill individuals	Both

Appendix IV – Types of Bioterrorist Acts and Which State (US or Canada) is More Vulnerable to These Acts/ More Likely to be the Victim of Such an Act Due to Qualities Possessed by the Target State

Type of Act	Which State is Most Vulnerable
Hoax	United States
Murder & assassination	United States
Small scale attack	United States (if attack is extortive)
Product tampering	United States
Agro-terrorism	Canada
Non-lethal	United States
Macroterrorism	Both

Appendix V – Comparison of Canada’s and the United States’ Efforts to Combat Bioterrorism

Program Type	American manifestation	Canadian manifestation
<i>International</i> G-7 (8)	Participant in G-7 anti-terrorism meetings in Paris, Lyon (1996), Halifax, and Ottawa (1995). Hosted G-7 meeting in Denver (1997) at which terrorism was discussed	Participant in G-7 meetings in Paris, Lyon (1996) and Denver (1997). Hosted meetings in Halifax and Ottawa (1995)
United Nations	Signatory to UN conventions on suppressing terrorist bombings and financing terrorism (1999). Signatory to BTWC (1972), and has participated in attempts to strengthen it	Signed 11 UN conventions suppressing terrorist acts since 1963. Chaired 2 meetings to produce drafts for conventions to suppress terrorism. Signatory to BTWC (1972), and has participated in attempts to strengthen it
Collaborative research programs	Financed programs in Russia through NASA, DOE, CDC, NIH, USDA, and Nunn-Lugar Cooperative Threat Reduction Program.	None
Export controls and sanctions	Participant in Australia group. Export Administration Act (1979), Chemical and Biological Weapons Act (1991), Anti-terrorism and Effective Death Penalty Act (1996), and various acts directed against specific unfriendly states prevent the export of materials that might be used to produce biological weapons to these states	Participant in Australia Group
<i>Domestic Preventative</i> New anti-bioterrorism laws	Anti-terrorism and Effective Death Penalty Act (1996) promises severe punishment for planning terrorism, fundraising for terrorism, using biological weapons, etc.	No anti-bioterrorism or even anti-terrorism laws enacted. Security Offences Act (1984) and laws prohibiting murder, arson, etc would be used to prosecute terrorists.
New domestic controls of biological agents	Anti-terrorism Act directed CDC to develop a regulatory framework to control transfer of 30 dangerous biological agents.	none
Changes to immigration laws	Anti-terrorism Act establishes provisions for deportation of alien terrorists	Plans to strengthen existing immigration policies

Increased funding for agencies responsible for prevention	Grants under 1996 Anti-terrorism Act to FBI totalling \$468 million. FBI's counterterrorism budget increased from \$256 million in 1995 to \$600 million in 1999.	No new funding for CSIS
<i>Consequence Mitigation</i> Training for first responders	Offered by DOD (until October 2000), DOJ, FEMA, EPA	DRES offers training, however, this training is not currently funded by any federal program
Training for medical personnel	ER Doctors and Public Health officials not usually asked to participate in training or exercises	Health Canada program to alert ER doctors to the signs of an anthrax attack
Exercises	Interagency exercises offered by DOD, US Secret Service, FBI, FEMA, HHS, EPA, DOE, State Department, VA, ATF	Yearly national field exercise for NBCRT
Rapid response teams	FBI's HMRU, Coast Guard National Strike Force Teams and Marine Safety Officers, EPA Environmental Response Teams, Air National Guard Prime BEEF units, Marines CBIRFs units, Navy Chemical Biological Radiological, Environmental Defense Response Teams, Army's 52 nd Explosive Ordnance Groups and TEU, National Guard's WMD Civil Support Teams (RAID) and Raid (Light). DOD assets coordinated by C/B-RRT.	NBCRT
Medical response teams	DMAT, OEP MMRS teams, NMRT	None
Grants to local government for purchasing of counter-bioterrorism related equipment	Offered by HHS's OEP MMRS grant program, DOJ, DOD	JEPP offers grants to provinces for emergency preparedness equipment
Medical stockpiles	OEP's NMRT stockpile, NPS	Decentralized caches of multiple-purpose medical supplies
R&D initiatives	Approximately 7,000 mostly funded through DARPA	Fewer projects with research concentrated at DRES
Coordinating agencies	National Coordinator for Security, Infrastructure Protection and	Health Canada's Centre for Emergency Response. Solicitor General, RCMP, and

	<p>Counterterrorism; NSC's Technical Support Working Groups; FBI's NDPO; Gilmore Panel; DOD's Joint Task Force – Civil Support; Assistant to the Secretary of Defense for Civil Support. Some coordinating functions performed by OMB, Attorney General, Director of FBI, Secretary of Defense</p>	<p>Emergency Preparedness Canada have some coordinating duties</p>
<p>Acts offering direction for counterterrorism efforts</p>	<p>PDD 39, PDD 62, Anti-terrorism and Effective Death Penalty, Defense Against Weapons of Mass Destruction Act</p>	<p>NCTP (revised 1995), Security Offences Act (1984), various memoranda of understanding between RCMP and local police forces. Federal government is currently developing policies to strengthen response capability.</p>